Water Stewardship Division

STRATEGIC PLAN 2008

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BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

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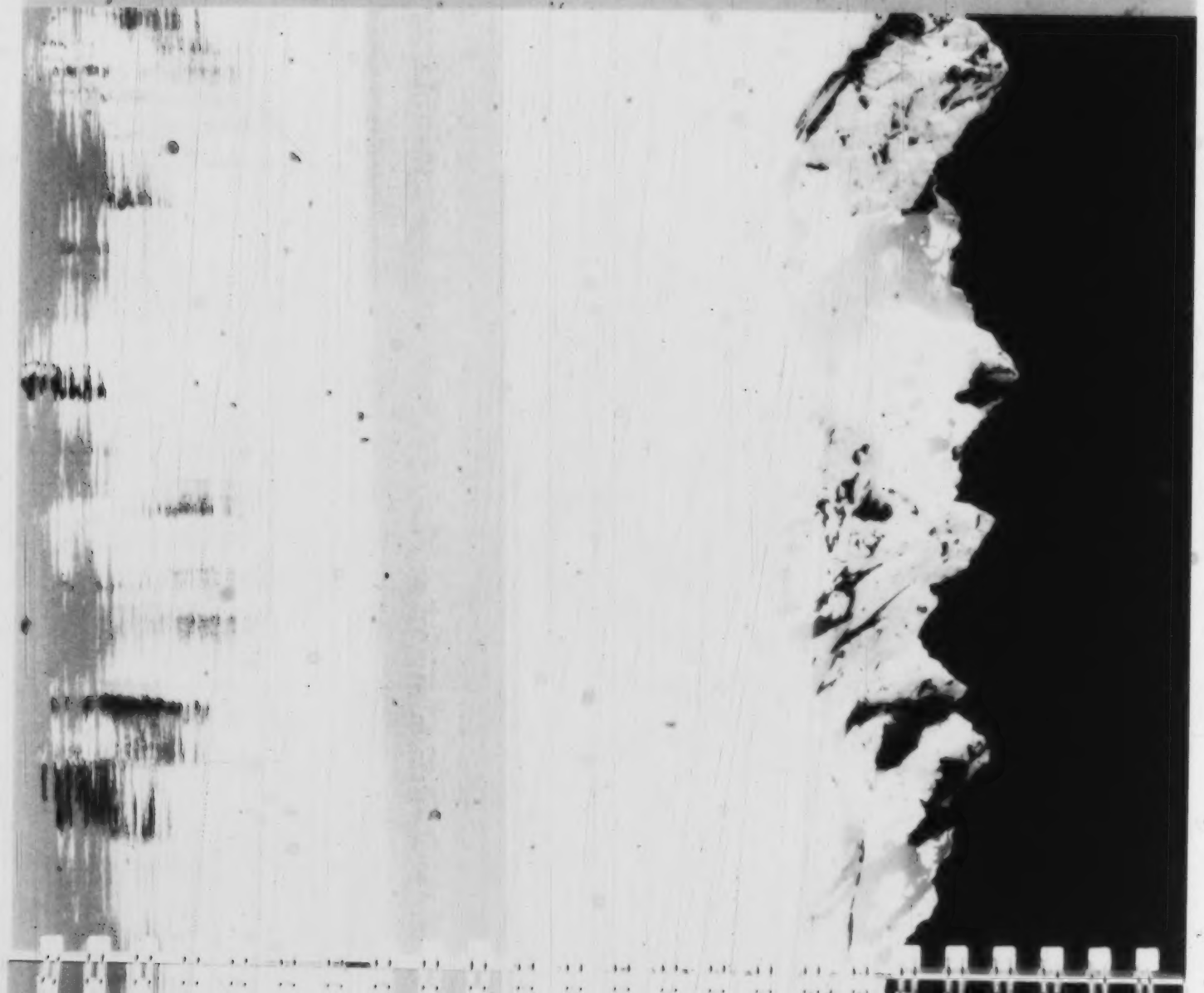

Photo:
Kevin Ronneseth

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People missing from the Management Committe photo are:
Larry Barr, Zita Botelho, Penny de Waal, Ian Graeme and Bill Kuhnke.

Photo:
Photographed by [illegible]

Welcome from the WSD Management Committee

Water is fundamental to British Columbia's communities, ecosystems, economy and identity. It is essential to our health and survival and it drives much of the province's vitality and growth. It is also a powerful force that can profoundly impact our communities through both floods and droughts. Climate change, urban and industrial growth and evolving governance roles are just a few of the dynamic forces that are shaping the stewardship of water in our province.

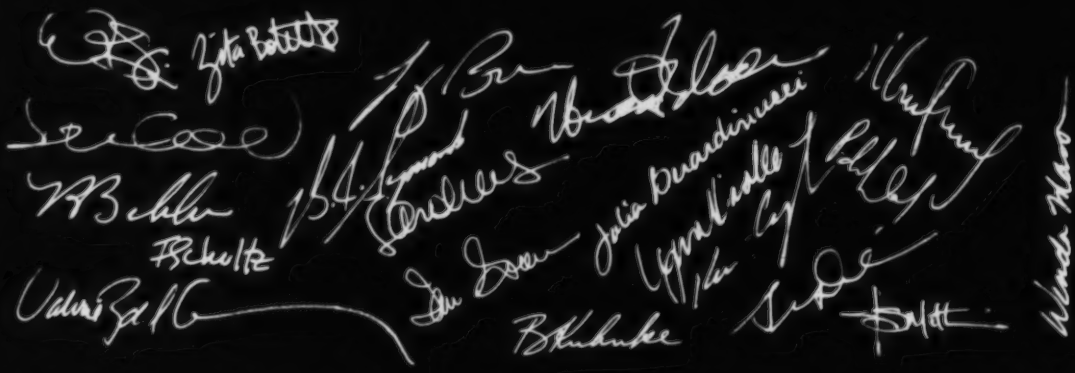
With this backdrop, we welcome you to the Water Stewardship Division's (WSD) strategic plan. Recognizing the significant challenges and opportunities currently facing the province's water resource, this plan sets out how WSD will manage B.C.'s greatest asset over the next several years. The purpose of this plan is to provide us the focus to ensure our day-to-day activities are aligned and coordinated towards realizing our vision:

Water for B.C.:

Safe, Sustainable and Valued by All

The Division as a whole has put a great deal of effort into this plan. We want to take this opportunity to thank everyone who has contributed their time and expertise. We as the WSD Management Committee believe in our vision and are committed to implementing this plan. We take great pride in the good work that we do and are excited about what the future brings.

If you are a current member of our team, a potential recruit, a partner or a member of the public, we hope you find this plan useful, inspirational and informative, and that you will join us in the stewardship of B.C.'s water resource.



WATER DEFINES US

Photo:
Brian Symonds

Water Defines Us

Water connects us all. It served as a primary transportation route that supported the exploration and settlement of the province. It generates our electricity, irrigates our crops, supports our industry and quenches our thirst. Rivers and lakes dominate our landscape and provide for the communities that have developed along their shores. First Nations have a rich cultural heritage that is intricately tied to water. Water supports our salmon and freshwater fish and much of our recreation and tourism. It has the power to shape our landscape, but also to put lives and communities at risk. It fuels our imagination about living in this magnificent place. Water defines us.

Our province is endowed with a wealth of resources in our glaciers, lakes, rivers and aquifers. This hydrological diversity is unrivalled anywhere else in the world. However, water is not evenly distributed in time or space, and the demands placed upon it are highly variable, creating both challenges and opportunities.

Every British Columbian has a responsibility to safeguard this legacy. We must ensure that our communities are safe, our water use is sustainable and our aquatic ecosystems are healthy. Business as usual puts this resource at risk. Becoming effective stewards of the resource, and leading and encouraging others to do the same will ensure it is sustained for future generations.

How Will this Plan Take Us Forward?

This strategic plan will guide the decisions and efforts of Water Stewardship Division over the coming years. It defines our mandate and priorities and illustrates how we will work with our partners to fulfill our role in the stewardship of B.C.'s water resource.

As illustrated below, the plan is informed by a number of inputs. It will be implemented through the Division's Annual Business Cycle (ABC) process and Employee Performance and Development Plans (EPDPs). The WSD Management Committee will use it to help set annual priorities and to monitor progress in the delivery of the Division's mandate. Branches and teams will use both the annual priorities and this plan to determine their resource requirements on a yearly basis. Through EPDPs, individuals will use this plan to help prioritize their efforts and ensure alignment with their Branch and Division. By formally linking the strategic plan, the ABC process and EPDPs, this framework provides the link between our daily, on-the-ground activities and the Division's and Government's strategic priorities.

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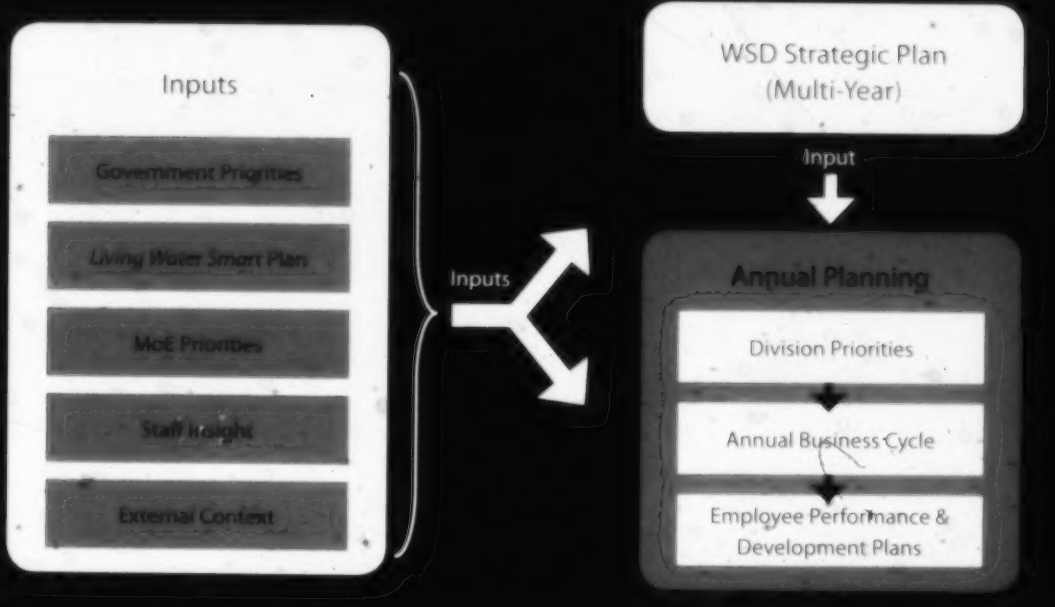
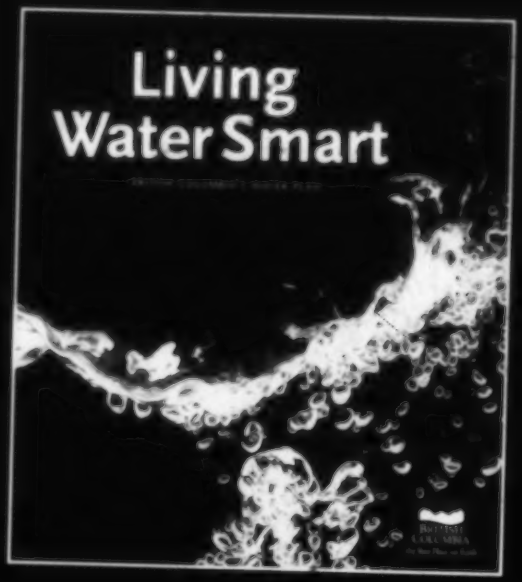
WSD Business Planning Process





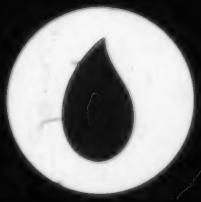
Living Water Smart: British Columbia's Water Plan

Recognizing that we need to carefully manage our water for the future, in June 2008 the provincial government launched *Living Water Smart: British Columbia's Water Plan*.

Living Water Smart is government's vision and commitment to ensuring that our water stays healthy and secure. This vision will be achieved through new actions and targets and by building on existing efforts. It is a plan for the whole Provincial Government, and many different ministries and our partners will play a role in implementation.

In addition to our many other responsibilities, WSD will lead delivery on many commitments in the *Living Water Smart* plan. For commitments that will be led by other agencies, WSD will still play an important supporting role.

LWS Icon



In addition to clarifying our mandate and existing priorities, another purpose of this Strategic Plan is to clarify how WSD will contribute to delivering Government's *Living Water Smart* commitments. You can tell which of the objectives, strategies and actions in this plan are part of that mission by looking for the LWS icon.

For more information about *Living Water Smart: British Columbia's Water Plan* visit **www.livingwatersmart.ca**.

What is Water Stewardship Division's Role?

WSD has primary responsibility for management of the province's water resource. We must balance among priorities including responsible use, the health and safety of communities and maintaining terrestrial and aquatic ecosystems. The Division applies a stewardship approach based on the principles of integrated water resource management. We have a regionalized organisation with nine regional offices and a headquarters in Victoria. Our structure consists of four branches as outlined in the following diagram.

Water Stewardship Division's Organisation Structure

Water Stewardship Division

Innovation and Planning

Develops regulatory and non-regulatory tools and partnerships to support water stewardship in B.C.

- Leads policy and plan development
- Leads continual evolution of legislation and policy
- Develops innovative approaches to water governance
- Creates regulatory and non-regulatory tools
- Leads and reports on *Living Water Smart* implementation

Regional Operations

Delivers WSD programs and services to clients throughout the province.

- Water licensing
- Works with First Nations partners
- Approves changes in/about a stream
- Source water protection
- Groundwater monitoring and protection
- Water quality and quantity monitoring
- Implements the dam and dike safety programs
- Conducts flood hazard investigations

Management and Strategies

Administers statutory responsibility for water rights and public safety.

- Water licensing
- Oversees administration of legislation associated with floodplains and dikes
- Regulates private water utilities
- Statutory and public safety functions related to floods and droughts
- Leads the WSD dam safety program
- Coordinates participation in First Nations' treaty negotiations

Science and Information

Provides information, research and knowledge regarding B.C.'s water resources.

- Collects water-related data for government
- Provides scientific analysis and guidance in support of planning and stewardship
- Provides forecasts and models to support risk management and decision making
- Collaborates in water science research

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WSD's People and Partners

Our People Make a Difference

The people of WSD are passionate about water. We work to ensure that it is used in ways that benefit the present and future generations of British Columbians. Our staff have diverse training and skill sets including flood forecasting, hydrology, policy making, water allocation, engineering, biology and many more. We continuously welcome new recruits who bring along new perspectives and innovative approaches. One of our great strengths is the unique combination of technical expertise and understanding of the social aspects of water management. Our diversity and ability to work together make us a professional, dedicated and dynamic team, focused on client service.

There are challenges on the horizon that will require WSD to respond proactively so that government policies, decisions and actions get us in front of the issues we must face. Recognizing the important role that stakeholders, industry and other agencies have in water stewardship, staff will also need new, less technical skills, particularly in the area of influence management, negotiations and project management. We must aiso continuously improve our capacity to work across government through collaboration with other divisions and agencies.

To realize our full potential, we must embrace a culture of learning and continuous improvement; one that celebrates our successes and learns from our challenges. This, combined with effective workforce planning, recruitment, training and management, will allow the Division to retain staff knowledge and expertise over the long-term. We support people who are passionate about one of this province's greatest assets and want to make a difference in how water is managed!

Photo:
Albert Chirico

Our Colleagues in the Ministry of Environment

WSD is situated within the Ministry of Environment, which encourages environmental stewardship, provides environmental education opportunities, engages stakeholders and actively promotes the sustainable use of British Columbia's environmental resources. The ministry also has regulatory responsibilities and administers an extensive list of legislation. The ministry sets standards and ensures compliance with these standards.

WSD works in partnership with other divisions to deliver this mandate and ensure the health of the province's water resource. For example, other divisions have responsibilities for protecting and restoring fish habitat, monitoring ambient water quality, permitting activities that affect water quality, monitoring aquifer levels, and enforcing water regulations, among others.

Given this distribution of responsibilities, WSD must work collaboratively and closely with others across the ministry to support the government's environmental goals and objectives. We work together to pursue government's Great Goal to "lead the world in sustainable environmental management, with the best air and water quality, and the best fisheries management, bar none".

Our Partners

WSD achieves its mandate through the strong and valuable support and contributions of others outside of the Ministry. True water stewardship requires integrated and cooperative planning and management involving all levels of government, First Nations, communities, industry, academia and the public. Recognizing this, the Division places a high priority on fostering water stewardship through public awareness, education, partnerships and outreach.

For a more information, please see the Appendix entitled *Water Stewardship Division's Partners*.

Unprecedented Challenges in Water Stewardship

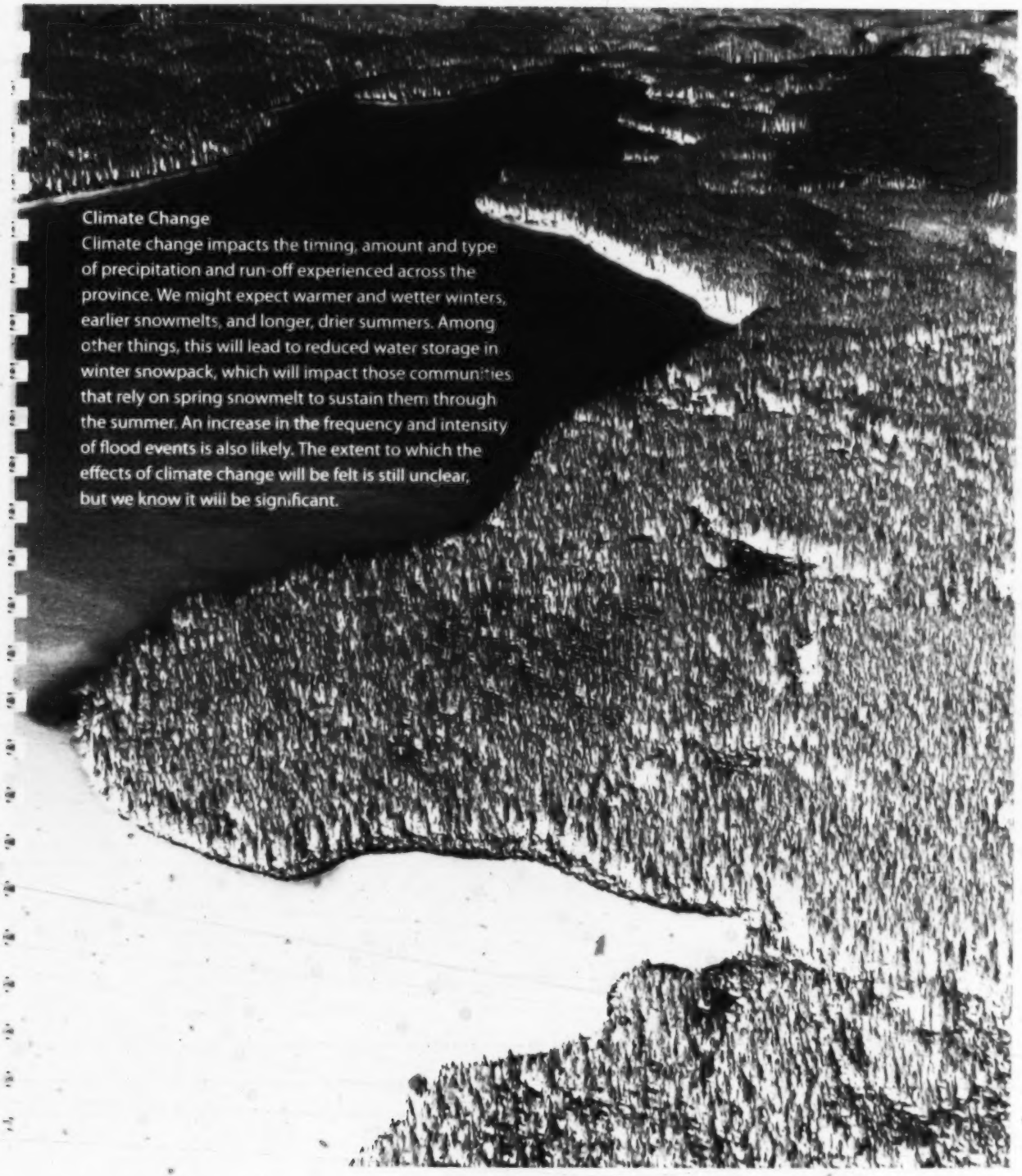
Water is a complex natural resource. In quality and quantity it is highly variable in both time and space. New and changing economic, social and environmental drivers introduce additional complexity that will dramatically influence the way we will work in the future. The following describes some of the many challenges we face.

Increasing Demand
Population growth, urban expansion, agricultural production, and natural resource extraction all contribute to increasing water demand. Already around the province, numerous surface water sources are experiencing shortages or have licensing restrictions. Many groundwater observation wells show declining aquifer levels. If current trends continue, water demand will grow by more than 30% in the next 25 years. We need to balance water allocation and groundwater extraction against the needs of ecosystems and society.

Transforming Role of Government
Government's traditional role has been that of *regulator*, ensuring compliance with laws through licensing, permitting and enforcement. While we maintain this function, we are also taking on additional roles to foster broad engagement in stewardship. We must be a *catalyst* to build increased interest and capacity for community-based planning. We must be an *enabler* to provide our stakeholders and residents with the right tools and information. We must be a *partner* and work with others to identify mutually beneficial solutions. We must become more transparent and inclusive in all of water management decisions.

Evolving Relationships with First Nations
The Province is committed to strengthening relationships with First Nations. Although progress has been made on improving consultation processes, there is more to be done. Ongoing work is also required to incorporate traditional knowledge and cultural values into the way water is governed and managed. Concluding treaties and other lasting agreements that will facilitate improved social and economic outcomes for First Nations is also a priority. Importantly, these agreements often contain provisions to provide sufficient amounts of water for community, agricultural and industrial purposes in order to satisfy a realistic vision of the potential development of Treaty Settlement Lands.

Public Demand for Water Safety
High profile and sometimes catastrophic drought, flood, and water quality incidents around the world have raised awareness about the power of water as a potentially destructive force. The public has increasing expectations that government will take measures to protect communities and public safety. While it is beyond our ability to eliminate all risk, we must continually monitor our changing environment and be adaptive. We must carefully plan for flood, drought, dam safety and drinking water source protection.



Climate Change

Climate change impacts the timing, amount and type of precipitation and run-off experienced across the province. We might expect warmer and wetter winters, earlier snowmelts, and longer, drier summers. Among other things, this will lead to reduced water storage in winter snowpack, which will impact those communities that rely on spring snowmelt to sustain them through the summer. An increase in the frequency and intensity of flood events is also likely. The extent to which the effects of climate change will be felt is still unclear, but we know it will be significant.

Innovative Responses from WSD

New and evolving challenges directly impact the focus and activities of our Division. While the full implications of each new driver are uncertain, we expect change and are ready for it through adaptive management. The following describes some of the ways we will innovate through this strategic plan, guided by *Living Water Smart: British Columbia's Water Plan*.

Modernizing B.C.'s Water Laws

Under *Living Water Smart*, government has committed that water laws will improve the protection of ecological values, provide for more community involvement and create incentives to be water efficient. For WSD, this means reviewing and modernizing the *Water Act*. This new legislation will recognize flow requirements for ecosystems and species. We will also continue our efforts to incrementally enhance the Ground Water Protection Regulation to guard the quantity and quality of our groundwater.

Ensuring Adequate Stream Flows, Ecosystem Health, and Protection of Groundwater

Ensuring healthy aquatic ecosystem function is a goal of every strategy in this plan. In addition to improving our water laws to meet this goal, working with other agencies, WSD will also support communities to do watershed management planning in priority areas. In the future, we will regulate groundwater use in areas that are under pressure and where large groundwater withdrawals are occurring. We will improve our approaches to water management and allocation to address impacts from a changing water cycle and climate change. Our decisions will be based on knowing what makes a stream healthy and we will help our clients secure this vital outcome along with the benefits of water use.

Working to Maintain Source Water Quality and Strengthen Flood Protection

Government has committed to improve the quality and protection of drinking water sources. For WSD, this means that we must clarify our role in source water protection and water quality. We will continue to encourage other agencies to better integrate water into their plans and decisions. We will continue work to minimize the impacts of flood and dam failures. Where new development on flood plains is unavoidable, we will set high provincial standards based on detailed engineering investigations.

Working With All Sectors to Reduce Water Consumption

Under the *Living Water Smart* plan, government has committed to improve water use efficiency in British Columbia by 33 percent by 2020. For WSD, this will mean requiring all large water users to measure and report their water use. It will also mean requiring all users to cut back their water use in times of drought or where stream health is threatened. We will work with our partners to look at new ways to help promising water conservation technology succeed. Under this plan, we are committed to developing a provincial water demand management strategy and to improving our understanding of water consumption across all sectors.

Improving Science and Information to Prepare for the Impacts of Climate Change

Leading science and integrated and accessible information is critical to the delivery of WSD's mandate. The Division will play a growing role in facilitating water-related natural and social science. Focused monitoring will support the efforts of the Division's branches, partners and stakeholders, assisted by expanding our hydrometric and other climate-related networks. We will also lead the development of a Water Science Strategy for B.C., which will take a long-term view of research priorities and knowledge gaps. In short, science will continue to be the foundation for much of what we do.

Photo
Brian Symonds

What Guides Water Stewardship Division?

Consistency in our decision making, operational activities and the way we interact with our partners is critical to the success of the Division. On a daily basis this can be challenging given the range of functions we are responsible for, our dispersed offices and the competing priorities we face. The principles below guide our day-to-day activities and are central to the way we work. They remind us of the way in which we have committed to working with each other and our partners.

Our Guiding Principles

Respect for Nature's Lessons
Our approach to stewardship is guided by several important and unique characteristics about water. We have learned these lessons from nature, and strive to address and respect them in everything we do. These lessons include:

- Water is the basis of life on earth; nothing can survive without it.
- All water is part of a single whole; glaciers, snow, lakes, rivers, streams, rainwater, and groundwater are all part of the same great water cycle and cannot be separated.
- Water has no substitutes in most of its uses.
- Water is renewable from year to year, but there is a finite supply.
- Water and land are intricately interconnected.

Collaboration
Achieving shared stewardship will only happen through working in partnership with communities, industry, First Nations, the public and other agencies in the pursuit of sustainable, long-term solutions.

Knowledge
Sound science, traditional knowledge, education and innovation are the foundation for developing adaptive management approaches that mitigate risks and influence behaviours.

Accountability and Commitment
We strive for accountability in everything we do as individuals and as a Division. Through this plan, we are communicating our priorities, commitments and actions and we will report regularly on our progress and lessons learned. We are committed to addressing the challenges and competing priorities of our daily work while remaining true to our vision and our objectives.

Client Focus
We strive to identify and develop ways to continuously improve client service. This means fostering positive relationships with our clients - the citizens, organizations and businesses of British Columbia. It also means discovering the best ways to meet client needs through responsive people, programs, policies, legislation, decision making and information systems.

Connectivity
We understand that the water resource is interconnected and that our decisions have impacts beyond the areas where we work and live. We will continually strive to consider the broader implications of our activities not only for the resource but also for the communities and ecosystems which rely upon it.

Stewardship
We subscribe to an ethic by which people care for and are responsible for the sustainability of water and aquatic ecosystems. Water stewardship places a priority on partnerships, capacity building and a greater role for all British Columbians.

Photo:
Rob Leloup

Reader's Guide to the WSD Strategic Plan

Our Vision

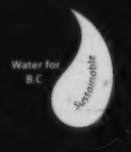
Water for B.C.:

Safe, Sustainable and Valued by All

Our Goals

Our vision has three components, which make up the overarching goals of the Division. Our strategic plan is oriented around these goals, as follows:

Safe: Water is vital to human existence, yet - through flood and drought - can also be a devastating force that can threaten life and property. WSD works to protect the health and welfare of British Columbians by minimizing the impacts of floods, dam failures, droughts and, in partnership with others, ensuring reliable community drinking water supplies.



Sustainable: Sustainable stewardship involves using and protecting water in ways that meet both human and ecosystem needs now and in the future. WSD pursues this goal by developing effective legislation and policies and through sound water allocation, planning, and outreach. Effective data collection and characterization are critical enablers and scientific analysis and interpretation are integrated into all our activities.

Valued by All: Stewardship results when all British Columbians understand the economic and intrinsic value of water and work to conserve it in our day-to-day lives. WSD works to improve this awareness in order to change behaviours and encourage efficient use. We also want to ensure that water is considered in the actions and decisions of other agencies and in jurisdictions with which we share the resource.

Our Framework

This Strategic Plan outlines our priorities over the next several years within the context of the vision and goals described above. Through our *objectives, strategies and activities,* we will deliver on our mandate, which is aligned with those of the Ministry and Government.

It is important to note that some of the activities contained in this plan will be new to us and are required to address the emerging challenges confronting us as water managers and the commitments made in *Living Water Smart: British Columbia's Water Plan*. We will build capacity in these areas and adapt our organization to address these shifts, while at the same time continually looking forward to anticipate and address future challenges.

Our Strategic Plan is composed of the following components:

Vision	Defines the overall outcome we are striving for over the next several years.
Goals	At the highest level, goals define the main outcomes we are working to achieve. Success in each goal will result in the realization of our vision.
Objectives	The tangible results that will be achieved in the execution of our strategies.
Strategies	Programs comprised of numerous projects that define what will be done to achieve our objectives.
Activities	Specific, individual projects and operations that we undertake to support our strategies.

Our Vision

Water for B.C.:

Safe, Sustainable and Valued by All

Goal 1: Safe

Objective 1.1
Minimize impacts of floods and dam failures

- Strategy 1.1.1: Ensure dike and dam safety
- Strategy 1.1.2: Carry out flood hazard investigations and establish flood protection standards
- Strategy 1.1.3: Manage flood protection works
- Strategy 1.1.4: Plan for, and respond to, flood emergencies

Objective 1.2
Safe and reliable community water supplies

- Strategy 1.2.1: Regulate private water utilities
- Strategy 1.2.2: Protect source water quality and quantity through partnerships and planning
- Strategy 1.2.3: Prepare water purveyors for drought, declining groundwater levels and low stream flows

Goal 2: Sustainable

Objective 2.1
Integrated water governance and planning that foster healthy ecosystems and sustainable use

- Strategy 2.1.1: Improve key legislation, regulations and policies to protect ecological values, involve communities, and provide incentives to be water efficient
- Strategy 2.1.2: Act as a catalyst and support locally-led water planning
- Strategy 2.1.3: Develop effective relationships with First Nations on water use issues

Objective 2.2
Water management activities and decisions balance human and natural values

- Strategy 2.2.1: Ensure water allocation decisions are timely, equitable, flexible and encourage efficient use
- Strategy 2.2.2: Manage and protect groundwater and aquifers
- Strategy 2.2.3: Integrate aquatic and riparian ecosystem health into decision making

Goal 2: Sustainable

Objective 2.3
Integrated and accessible information on British Columbia's water resource

- Strategy 2.3.1: Monitor and characterize provincial water resources based on relevant and authoritative data
- Strategy 2.3.2: Validate, manage and provide water resource information

Objective 2.4
Leading science informs decision making

- Strategy 2.4.1: Lead and facilitate the development and implementation of a Water Science Strategy for B.C.
- Strategy 2.4.2: Continuously improve and deliver science-based models and forecasts to support planning and decision making
- Strategy 2.4.3: Translate and communicate scientific knowledge, conduct analysis and support research to guide policy and planning
- Strategy 2.4.4: Assess emerging water issues and trends on an ongoing basis

Goal 3: Valued by All

Objective 3.1
British Columbians recognize the many values of water and share responsibility for stewardship

- Strategy 3.1.1: Improve understanding of the value of water to British Columbia
- Strategy 3.1.2: Develop and implement a provincial water demand management strategy

Objective 3.2
Water stewardship is integrated into the decisions and actions of other agencies and entities

- Strategy 3.2.1: Participate effectively in multi-party policy making that affects the water resource
- Strategy 3.2.2: Protect British Columbia's interests in inter-provincial, national and international negotiations affecting trans-boundary water management

Objective 1.1

Minimize impacts of floods and dam failures

The province's water resource provides many benefits to British Columbians. At the same time, it can present significant risks to public safety, property and human health, for example because of water quality problems or extreme conditions such as floods or droughts.

The Water Stewardship Division plays an important role in minimizing the occurance and adverse impacts of water-related risks. Through various statutory responsiblities, the Division is the lead provincial agency for flood and drought planning and preparedness, and for dam safety. Efforts within this area include regulating the safety and effectiveness of infrastructure used to mitigate these risks, flow monitoring and forecasting services and public outreach. In addition, the Division operates selected flood control systems, including the maintenance of specific dikes. In times of emergency, Division staff work with other agencies in coordinated response efforts.

Photo: Ron Henry

Desired Results

The successful delivery of this objective will result in the following:

- Dam owners are aware of and compliant with dam safety regulations.
- Diking authorities operate and maintain flood protection works to acceptable standards.
- Economic and social costs associated with floods and droughts are reduced.
- Adverse impacts from floods or droughts are reduced through effective monitoring and response efforts.
- Accurate information on flood hazards and the consequences of floods is available to local governments and others (e.g., floodplain maps).
- Where new development on flood plains is unavoidable, it will be flood-proofed to high provincial standards.
- Government provides financial resources for flood protection to help communities manage flood losses.

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- Climate change increases the uncertainty and variability associated with extreme weather events.
- The impacts of floods and droughts often cross jurisdictional boundaries and require multi-agency coordination to affect an appropriate response.
- Individuals, industry and government assess and accept risk differently regarding flood hazards and water use.
- Infrastructure upgrades are costly.

Photo: David Weir

refers to a commitment made in *Living Water Smart*

Strategy 1.1.1
Ensure dike and dam safety
The Division leads the regulation of dike and dam safety across the province. Dam owners and diking authorities must comply with standards and regulations so that public safety, property and the environment are not put at undue risk from unexpected failures of these works.

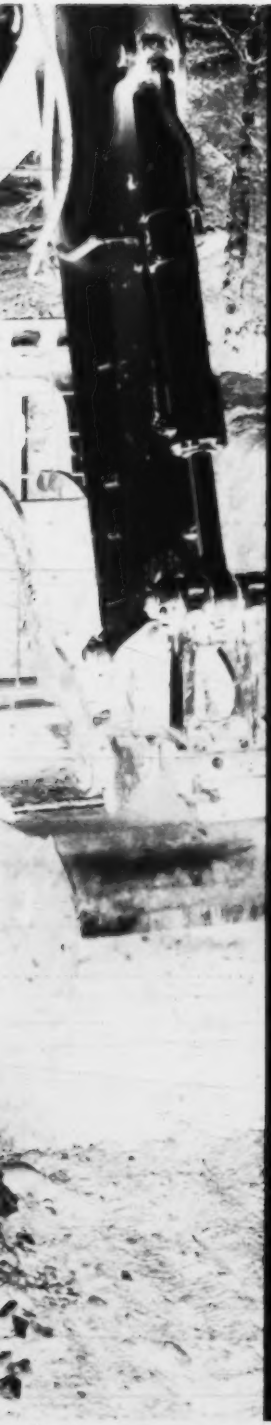
Activities
The main activities undertaken within this area include:

- Manage the provincial programs for dam and dike safety.
- Review and approve new dam and dike projects, rehabilitations and removals.
- Maintain the provincial dam and dike database.
- Educate dam owners and diking authorities, and create public outreach tools to build awareness of safety issues and maintenance standards.
- Implement the dam and dike compliance audit programs.
- Develop and implement provincial policy on orphan dikes.

Strategy 1.1.2
Carry out flood hazard investigations and establish flood protection standards
The Division is responsible for developing and maintaining accurate and accessible information on flood hazards and for setting standards for flood protection works. The Division uses the latest data and modeling information to assess local flood risks and to ensure that the appropriate standards are reflected in land use management plans and new flood protection projects.

Activities
The main activities undertaken within this area include:

- Collect knowledge regarding flood hazards and risks including the preparation and updating of floodplain maps.
- Set high provincial standards for flood protection works based upon detailed engineering investigations.
- Support flood hazard land use management by local governments and provincial land managers.
- Audit effectiveness of current flood hazard area land use management guidelines.
- Provide technical support to local governments for preparation of new floodplain bylaws and other land use regulatory tools.



Strategy 1.1.3

Manage flood protection works

The Division has responsibility for operating and maintaining the flood control systems for the Okanagan, Mission Creek, Vedder River, and Coquitlam District.

Activities

The main activities undertaken within this area include:

- Inspect, monitor and maintain flood protection works.
- Manage surveying, hydraulic modeling and sediment management contracts.
- Look for opportunities to transfer the responsibility for operation and maintenance of these works to other agencies and local authorities.

Strategy 1.1.4

Plan for, and respond to, flood emergencies

The Division plays a key role in predicting river flows and advising of potential flood emergencies through our River Forecast Centre. Also, in partnership with others, we respond to flood emergencies to reduce risks to public safety. We employ technical knowledge to determine where the impacts of flood hazards will likely occur and to ensure that appropriate response efforts are undertaken to address those impacts.

Activities

The main activities undertaken within this area include:

- Maintain and activate the Dam Emergency Response Plan when necessary.
- Plan for, organize and participate in flood responses as identified in the B.C. Flood Plan.
- Develop flood mitigation approaches.
- ❶ Provide advice to our partners in emergency management on the administration and distribution of flood protection funding to help communities manage flood losses.

❶ refers to a commitment made in *Living Water Smart*

Objective 1.2

Safe and reliable community water supplies

WSD plays a vital role in ensuring safe, reliable water for communities in three ways. First, under the *Water Utility Act* and the *Utilities Commission Act*, we are responsible for the approval and regulation of over 160 privately-owned water utilities serving approximately 20,000 households. We ensure that systems are designed to meet domestic, commercial, and fire flow needs and that customers of these utilities receive acceptable water service at reasonable rates. Second, we promote and support ground- and surface source water protection as the first step in a multi-barrier "source to tap" approach to drinking water safety. Finally, we assist water purveyors to prepare for droughts, declining groundwater levels and low stream flow events and to respond effectively when they occur.

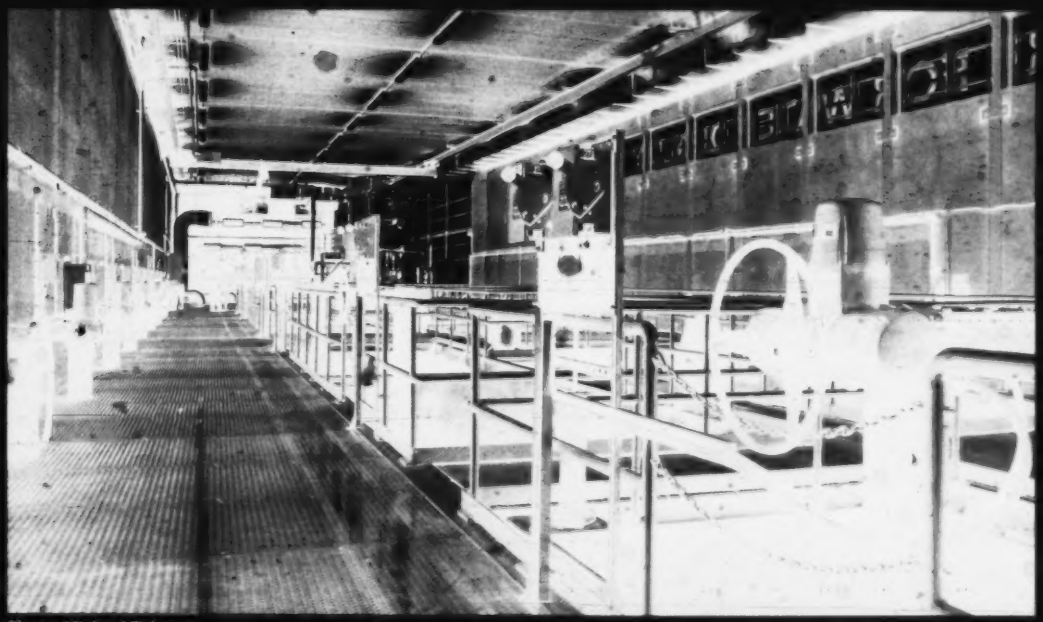


Photo: Michael Firlotte

Desired Results

The successful delivery of this objective will result in the following:

- The quality and quantity of drinking water sources is improved.
- Threats to water quality and quantity are minimized in watersheds with multiple land uses.
- Roles and responsibilities around drinking water are clearly defined and understood.
- Private water utilities provide safe, reliable drinking water to communities at reasonable rates.
- Communities have adequate water supplies during droughts and low stream flow events. The economic, social and environmental costs of droughts and groundwater declines are minimized.
- Drinking water quality in all Aboriginal communities meets the same provincial standards applied across British Columbia.
- Adequate water supply is available for the public, ecosystems and the economy.

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- Responsibility for drinking water protection is shared among different levels of government, provincial agencies, the private sector and citizens.
- Many private water systems are getting older and require infrastructure upgrades.
- In situations where private water systems are no longer financially viable, local governments may have limited resources to accept responsibility for them.
- The "myth of water abundance" results in drought planning receiving low priority.

Photo: Michael Firlotte

Photo: Michael Firlotte

refers to a commitment made in *Living Water Smart*

Strategy 1.2.1

Regulate private water utilities

Under the *Water Utility Act* and the *Utilities Commission Act* the Division is responsible for issuing and monitoring operating permits for small private water utilities. This involves reviewing design proposals against specific standards for drinking water quality, quantity and system integrity. For established water systems, WSD has the regulatory authority to ensure that commercial operators provide water at fair and reasonable rates. WSD mediates water pricing disputes between operators and customers and assists with transfer of ownership of private systems to local government water purveyors where appropriate. Success in this area sees a constant and reliable supply of safe drinking water at reasonable rates.

Activities

The main activities undertaken within this area include:

- Assess the design, construction and financial viability of each new private water utility application and/or amendments to existing water systems to ensure they meet approved design standards and guidelines.
- Ensure that water rates to customers are fair and reasonable.
- Update provincial design specifications and guidelines to reflect changes in technology and requirements of other responsible agencies.
- Review private utility operations and long-term financial viability.
- Where appropriate, facilitate the transfer of ownership of private utilities to local government water purveyors.

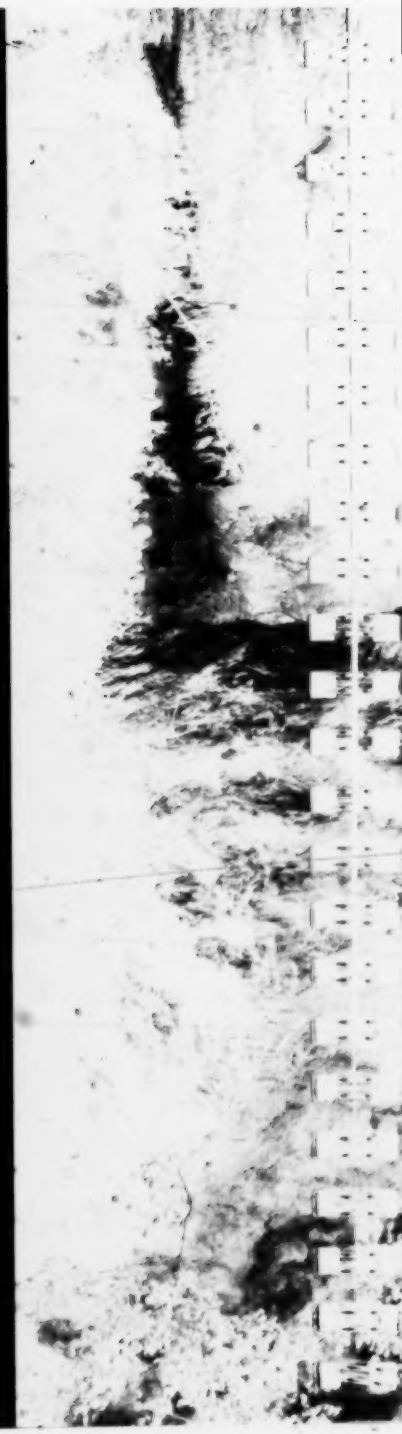


Photo:
Rick Hardy

Strategy 1.2.2

Protect source water quality and quantity through partnerships and planning

Under *Living Water Smart: British Columbia's Water Plan*, government has committed to improve the quality and protection of drinking water sources. WSD will contribute to this outcome through multi-agency partnerships and planning processes. Key to this approach is the early identification of risks to rural and urban water supplies, and the creation of strategies to reduce those risks. Our work is accomplished through partnerships with responsible provincial health agencies, Health Authorities, water purveyors, other provincial and federal agencies, local governments, private well owners, and user groups at the community level. We set water quality guidelines and objectives to ensure ecological health. We provide relevant information, guidance, technical expertise, tools or other forms of support. Our desired outcome is proactive planning in multi-use watersheds and groundwater protection areas, and science-based decisions regarding land use activities that affect drinking water, whether from ground or surface sources.

Activities

The main activities undertaken within this area include:

- Support the responsible provincial health agencies to implement the *Drinking Water Protection Act*.
- Participate in planning processes such as regional Drinking Water Teams to identify and act on potential risks to source water in individual watersheds.
- Work with other agencies and divisions to promote and disseminate water quality guidelines and objectives.
- Participate in and support local and multi-agency source water protection planning processes by providing information, guidance, expertise, tools and other forms of support.
- Assist with assessments of potential risks to source water including risks associated with new development or human activity.
- Support provincial health agencies, Health Authorities and water purveyor efforts and projects to protect source water.
- Support source to tap assessments with science, information and expertise.
- Support Health Authorities to complete mitigation response plans and develop drinking water protection plans.
- Work with partners in the ministry and elsewhere to ensure that effective compliance and enforcement activities are undertaken to protect both ground and surface sources of drinking water in high risk areas.

SAFE

Strategy 1.2.3

Prepare water purveyors for drought, declining groundwater levels and low stream flows

The Division has responsibility for drought preparedness and securing the supply of water in times of low stream flows to minimize the impact of these events. This involves maintaining provincial drought management policies and plans. We monitor and project stream flows and groundwater levels to ensure early warning of water shortages. Finally, we work with water purveyors and local communities to ensure that they have the necessary information to respond accordingly when droughts are forecast.

Activities

The main activities undertaken within this area include:

- Predict and monitor available water supplies, groundwater levels and stream flow conditions.
- Maintain and up-date provincial drought management policies, procedures and plans.
- **O** Require all users to cut back their water use in times of drought or where stream health is threatened.
- Participate in responses to droughts and low stream flow events.

Water for B.C. — Sustainable

Objective 2.1

Integrated water governance and planning that foster healthy ecosystems and sustainable use

Water is a crown resource over which the Province has jurisdiction. For WSD, much of our authority flows from the *Water Act*, which creates a comprehensive regime for allocating water rights. However, modern challenges demand that we continuously review and update all of our legislation, regulations and policies. This means looking beyond allocation and permitting to better balance water demands and ensure healthy aquatic ecosystems. We must also more effectively link our management of groundwater and surface water resources. *Living Water Smart: British Columbia's Water Plan* states that, by 2012, water laws will improve the protection of ecological values, provide for more community involvement, and provide incentives to be water efficient.

Living Water Smart also calls on us to support communities to do watershed management planning in priority areas. Effective planning is critical to maintaining the integrity of the resource, both in terms of quality and quantity. A strong planning framework allows us to make appropriate water allocation decisions. It also contributes to our goal of protecting both groundwater and surface water for drinking and aquatic habitat.

Another key part of our governance system is our legal obligation to consult over key water use decisions that may impact First Nations' rights. We participate in treaty negotiations involving water and support the work of other agencies to improve water quality in Aboriginal communities.

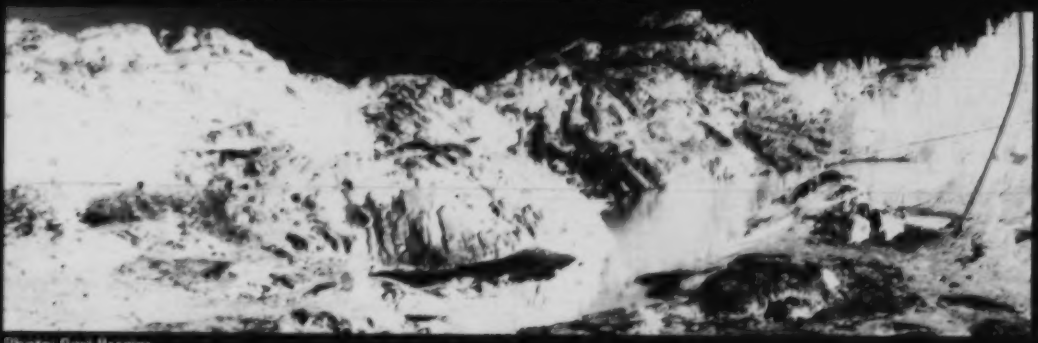


Photo: Bert Brazier

Desired Results

The successful delivery of this objective will result in the following:

- High public confidence in government as an effective water steward.
- A holistic, science-based and equitable water allocation system.
- Balanced and effective management of both surface water and groundwater resources, including management of cumulative impacts.
- Legislation recognizes instream flow requirements for ecosystems and species.
- Water use and development activities are planned in a way that growth does not exceed natural capacity or water supply.
- Communities, First Nations, stakeholders, the private sector and experts are engaged in effective planning.
- Treaties and other related agreements support providing a clean and safe domestic, agricultural and industrial water supply for First Nations communities.
- Drinking water quality in Aboriginal communities meets the same standards applied across British Columbia.
- Improved engagement with First Nations over water use decisions.

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- To ensure healthy ecosystems we need a better understanding of instream flow requirements for ecosystems and species.
- To accommodate growing demand, we need better methods for deciding how to allocate water in order to meet future needs and ensure ecosystem health. This will require legislative change.
- We must improve the integration of our legislation and regulations governing groundwater and aquifers with our system for managing and allocating surface water.
- Water flow in a large number of basins and watersheds in the province is not measured and only a small fraction of aquifers are monitored, limiting our predictive capacity.
- Water management is not always considered in land use planning processes.

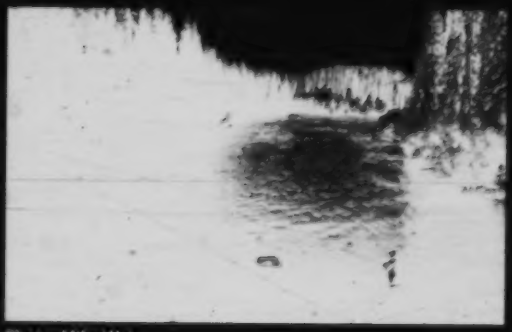


Photo: Mike Wei

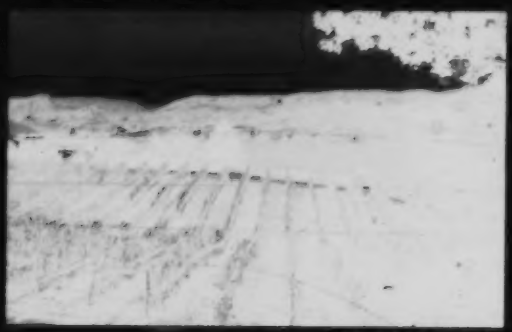


Photo: Brian Symonds

refers to a commitment made in *Living Water Smart*

Strategy 2.1.1

Improve key legislation, regulations and policies to protect ecological values, involve communities, and provide incentives to be water efficient

WSD leads development of legislation, regulations and policies that govern water management. We must continuously review and update these tools to meet new challenges. Looking ahead, three areas require priority action in the coming years: First, we will seek to modernize the *Water Act*. This will involve reviewing the basic principles that are used to licence water to determine if they continue to best serve the needs of British Columbians. Second, we will continue to enhance and implement a comprehensive Ground Water Protection Regulation. This will include regulating groundwater extraction in areas where there are significant development pressures and the resource is under threat. Finally, we will develop and implement a comprehensive policy on instream flow requirements for species and ecosystems. These actions will allow WSD to make more informed d[illegible]ons about how to allocate water, both in terms of meeting ecosystem requirements and optimizing the amount of water available for beneficial use.

Activities

The main activities undertaken within this area include:

- Consult with a broad range of stakeholders and the public on water legislation and policy.
- Support and learn from local initiatives with innovative new governance arrangements.
- O Develop a new *Water Act* for consideration by Government that ensures aquatic ecosystem health, provides more flexibility while respecting existing rights, integrates surface and groundwater management, and encourages efficient use.
- O Work with other divisions and agencies to build a comprehensive policy on instream flow requirements for species and ecosystems using existing policy as a basis.
- Use the new instream flow requirements policy as a tool to guide planning processes, allocation decision making and water demand management activities.
- O Complete phases 2 and 3 of enhancing the Ground Water Protection Regulation for consideration by government to protect the quality and quantity of groundwater.
- O Regulate groundwater use in priority areas and large groundwater withdrawals.

O refers to a commitment made in *Living Water Smart*

Photo
BC Hydro

Strategy 2.1.1

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Activities

The main activities undertaken within this area include:

- Consult with a broad range of stakeholders and the public on water legislation and policy.
- Support and learn from local initiatives with innovative new governance arrangements.
- ● Develop a new *Water Act* for consideration by Government that ensures aquatic ecosystem health, provides more flexibility while respecting existing rights, integrates surface and groundwater management, and encourages efficient use.
- ● Work with other divisions and agencies to build a comprehensive policy on instream flow requirements for species and ecosystems using existing policy as a basis.
- Use the new instream flow requirements policy as a tool to guide planning processes, allocation decision making and water demand management activities.
- ● Complete phases 2 and 3 of enhancing the Ground Water Protection Regulation for consideration by government to protect the quality and quantity of groundwater.
- ● Regulate groundwater use in priority areas and large groundwater withdrawals.

Photo
BC Hydro

Strategy 2.1.2

Act as a catalyst and support locally-led water planning

WSD will act as a catalyst and supporter of water planning at the local and regional level, as well as participate actively in broader land use planning processes. We will be selective and strategic in allocating limited resources to this task. However, our contributions may include providing expertise, information, tools, process support, staffing support or financial resources. Our planning work will be informed by consultation and engagement with our partners and local residents. We will use completed plans to guide our own decision making (including allocation decisions) and promote integration of groundwater and surface water management.

Activities

- Support and participate in locally-led watershed and water management planning, focusing efforts on priority areas (e.g., locations with water shortages, user conflicts, aquifers under threat, flood control concerns, or pressing threats to ecosystem health).
- Participate in and support strategically selected Water Supply and Demand Studies.
- Participate in and support Drinking Water Protection Plans and other source water protection planning processes.
- Lead development and updating of Water Allocation Plans in appropriate watersheds around the province.
- Continue to participate in BC Hydro's Water Use Plans to support their operations.
- Provide available scientific information, technical expertise and other resources to local planning processes as appropriate and where feasible.
- Where appropriate, align WSD policies and decision making with approved plans.
- Prepare a guidebook for local governments on Water Management Plans.
- Encourage integration of water planning and technical information into Official Community Plans, Regional Growth Strategies and other local government planning processes.

Photo:
Mike Wei

Strategy 2.1.3
Develop effective relationships with First Nations on water use issues

Addressing Aboriginal interests is a critical component of our Division's activities. Government policy and new legal requirements make it imperative that potential adverse impacts to Aboriginal and treaty rights are avoided and that First Nations' interests are considered in land and resource decisions and planning. We have a duty to consult First Nations on allocation decisions and resource planning processes. Beyond ensuring that this duty is fulfilled, WSD will also be a leader in forging stronger, collaborative, government-to-government relationships with First Nations.

Activities

- ◊ Participate in a coordinated approach to treaty negotiations involving water that support providing clean and safe domestic, agricultural and industrial water supply for First Nation communities.
- Develop improved processes to ensure that effective consultation and accommodation obligations are met and fulfilled on water allocation decisions.
- ◊ Support the work of partners in First Nations, provincial and federal agencies to ensure that drinking water quality in all Aboriginal communities meets the same provincial standards applied across British Columbia.
- ◊ Support work that preserves First Nations' social and cultural practices associated with water.

◊ refers to a commitment made in *Living Water Smart*

Objective 2.2

Water management activities and decisions balance human and natural values

WSD's surface water allocation activities (licences, amendments and short-term use approvals) and our groundwater regulation work supports critical activities and services including the provision of drinking water, the generation of electricity, crop irrigation, recreation and many others. We strive to continually improve the efficiency and effectiveness of our processes for assigning and protecting water rights and ensuring sustainable long-term security of supply for all kinds of water users.

Our surface water allocation and groundwater management activities are evolving to proactively balance demand with supply. We are working to better integrate surface water and groundwater management. This requires that we consider and prepare for times of drought and low-flow that will impact systems that are already water stressed. We will support licence holders, well owners and all British Columbians to use water efficiently. All of the above are undertaken with the overarching goal of ensuring healthy water quality, instream flows, riparian habitat and aquatic ecosystems.

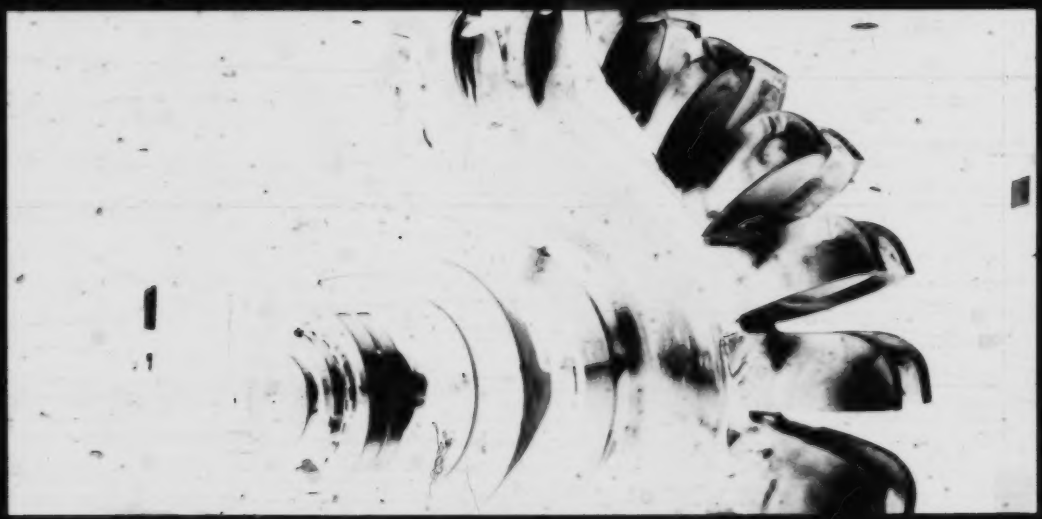


Photo: Canyon Hydro

Desired Results

The successful delivery of this objective will result in the following:

- ❶ Staff know what makes a stream healthy and are able to help land and water users factor in new approaches to securing stream health and the full range of stream benefits.
- Water allocation decisions are made in a timely fashion.
- The public has high confidence in our water allocation processes.
- Adaptive in-season management of water results in reduced user conflict.
- First Nations' rights associated with water are respected.
- Access to water is secure for economic growth.
- Aquatic ecosystems and aquifers are healthy.
- We maintain strong working relationships with other agencies and stakeholders.

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- Information about water availability, actual use and aquatic ecosystem needs is often inconsistent or unavailable.
- Most groundwater extraction is not currently regulated.
- Some streams around the province are already fully or close to fully allocated.
- We need consistent interaction and working arrangements with others who have authority to approve water use.
- Our scientific understanding of the interactions between groundwater and surface water around the province is limited.
- We need to ensure we have capacity to meet changing public expectations and a changing legal framework.

Photo: Machelle Tiernan

❶ refers to a commitment made in *Living Water Smart*

Strategy 2.2.1

Ensure water allocation decisions are timely, equitable, flexible and encourage efficient use

Ensuring that we effectively fulfill our role as the water licensing and approval body for the Province is a central goal of this strategic plan. Water licensing activities must be informed and backed by adequate science and analysis and consider the needs and demands of other water users, First Nations, and stakeholders who depend on the same water system. These processes must also evolve to accommodate new applications while maintaining the integrity of aquatic ecosystems. We seek to minimize the potential for user conflicts, Environmental Appeal Board hearings, and other challenges to our decisions through the use of transparent, science-based processes.

Activities

The main activities undertaken within this area include:

- Process licence and approval applications fairly and in a timely manner.
- Continuously improve the efficiency of the water allocation process through initiatives such as the Water Allocation Streamlining Process (WASP).
- Develop and implement an online licensing system (Water E-Licensing).
- Systematically reduce the backlog of licence and amendment applications.
- Adjudicate licence applications for Independent Power Producers in a manner that is consistent with provincial government corporate policy.
- Ensure decisions are informed by planning processes such as Water Management Plans, Water Allocation Plans, Source Water Protection Plans and other land use plans.
- Work with partners in other divisions to implement effective monitoring, compliance and enforcement mechanisms for licences and approvals.
- Improve mechanisms for addressing abandonment, cancellation and reallocation of water licences.
- Improve stream flow estimation techniques for allocation decisions on ungauged basins.
- Work effectively with other agencies that have water allocation responsibilities such as the Oil and Gas Commission, and where appropriate, establish Memoranda of Understanding to coordinate allocation policy, processes and decision making.
- Work with the sector and partners in the Ministry of Agriculture to secure access to water for agricultural lands while also requiring more efficient water use.
- Consult effectively with First Nations on water allocation decisions and ensure that legal obligations are fully met.
- Audit licensed and unlicensed usage in selected watersheds and aquifers and integrate findings with instream flow models.
- Introduce new provisions that limit all new licences to 40-year terms in areas where there is high demand and pressure on water.
- Introduce new provisions that require all large water users to measure and report their water use.

refers to a commitment made in *Living Water Smart*

Photo: Stephanie Tam

Strategy 2.2.2

Manage and protect groundwater and aquifers

Development and population growth places a number of pressures on aquifers and groundwater including aquifer mining, reduced recharge rates, user conflicts, and contamination by toxic substances. Protecting the safety and security of aquifers is essential to communities that use wells as a source of drinking water. Groundwater also provides sustained flow and temperature control to streams and lakes to sustain aquatic habitat, particularly during times of low precipitation. WSD will continue to implement existing groundwater regulations covering well construction, operation and maintenance. Looking to the future, we will also require mandatory submission of groundwater data as well as regulation of groundwater extraction in priority areas. This work will be supported by the best available aquifer data and groundwater science.

Activities

The main activities undertaken within this area include:

- In collaboration with other divisions, provincial agencies and Health Authorities, ensure compliance with the Ground Water Protection Regulation through outreach and enforcement.
- Work with responsible provincial health agencies, Health Authorities and water purveyors to develop well protection plans for all drinking water supply system wells.
- Work with responsible provincial health agencies, Health Authority staff and local governments to protect source water and develop and implement aquifer protection plans.
- Continue outreach with well drillers and pump installers to ensure that they are fully trained in regulatory and data provision requirements.
- Update the driller's handbook and other outreach and education tools.
- Continue to develop and implement outreach programs for private well owners and other groundwater users to enable them to protect their water supplies and community aquifers.
- Provide information and expertise to support protection of groundwater through the waste discharge permitting activities of other divisions.

Photo:
Kevin Ronneseth

Strategy 2.2.3

Integrate aquatic and riparian ecosystem health into decision making

Ensuring healthy aquatic ecosystem function is a goal of every strategy within this plan. Ecosystems support strong and productive fish and wildlife populations and provide reliable drinking water sources. WSD approves activities in and about a stream under the *Water Act*. We assist other divisions with the ongoing implementation of the Riparian Areas Regulation. We will also develop mechanisms to reduce water use, when required, to maintain aquatic ecosystem health (for example, during times of drought). This work must be closely coordinated with the efforts of our partners in other divisions, agencies and levels of government.

Activities

The main activities undertaken within this area include:

- Ensure fish and aquatic values are considered when making water allocation decisions (based upon an updated, comprehensive policy on instream flow requirements).
- Help water users factor in new approaches to secure stream health and the full range of stream benefits.
- Ensure that aquatic ecosystem needs are considered by developing a fair system for reducing licensed water use on systems that are fully or close to fully allocated and during shortages.
- Issue approvals under the *Water Act* for changes in and about a stream in a manner that recognizes the needs of aquatic ecosystems and riparian habitats.
- Establish new policy for conservation licences to sustain aquatic values.
- Assist other divisions and agencies to identify and designate flow-sensitive streams and, where appropriate, develop recovery plans.
- Support the efforts of partners working with the private sector and communities to conserve and restore stream function.
- Support the efforts of partners working to protect and rehabilitate wetland and waterway function.

refers to a commitment made in *Living Water Smart*

Water for B.C. Sustainable

Objective 2.3

Integrated and accessible information on British Columbia's water resource

Water availability varies greatly across the province and throughout the year. Similarly, different regions face different risks associated with flood and drought. In order to act as effective water stewards, a strong understanding of its distribution, variability (in both space and time) and use across the province is critical.

Our Division plays a key role in the collection, management and interpretation of information about water for the province. Our efforts focus on four main areas: 1) data collection; 2) managing and integrating the information; 3) making the information accessible; and, 4) providing the information in appropriate formats to support planning and decision making processes. We also need to improve our appreciation of how other sources of information such as traditional ecological knowledge can contribute to improving our understanding of the resource.

Responsibility for monitoring and data collection is shared across the provincial government as well as with other levels of government and industry. WSD is primarily responsible for hydrometric monitoring, the Groundwater Observation Well Network, priority aquifer studies, snowpack monitoring and water quality data used for environmental trend monitoring and assessment, specific planning or to support research. We work with our partners to share and integrate available data to ensure planners, researchers, decision makers, stakeholders and the public have access to the best available information.

Desired Results

The successful delivery of this objective will result in the following:

- Improved hydrometric and other climate-related networks – more complete and comprehensive monitoring networks including infrastructure are established to support water resource stewardship across the province.
- An improved and geographically expanded water quality monitoring network.
- Water resource information is fit for purpose, easily shared, accessible and usable.
- Water resource information can be linked and integrated with other land, resource and marine information at different levels of planning.
- Improved characterization capability – our scientific knowledge, research, and innovative modeling tools improve our ability to characterize and forecast water resource conditions (surface water and groundwater, quantity and quality) for priority waterways and land areas across the province.
- High levels of compliance with water data submission requirements.
- Information management systems ensure the integrity and quality of water-related information.

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- The quality of water data currently collected is variable.
- There is a backlog of data that has not been analyzed, verified or made publicly available.
- We need coordinated data collection and management.
- Information is sometimes in a format that is not easily accessible to a wide range of users.

Photo: Brian Symonds

refers to a commitment made in *Living Water Smart*

Strategy 2.3.1
Monitor and characterize provincial water resources based on relevant and authoritative data

The Division plays a lead role in the collection of water-related information across the province, with a specific focus on hydrometric data, groundwater and snowpack monitoring and water quality and quantity assessments. This information forms the foundation of research and monitoring, and supports delivery of our mandate. Good information allows us to maintain an inventory of the water resource and its variability under changing environmental conditions.

Activities

The main activities undertaken within this area include:

- Expand British Columbia's hydrometric and other climate-related networks.
- Monitor and characterize stream flows and lake levels (conducted in partnership with other organizations).
- Monitor and characterize aquifer properties (levels, quality, quantity, hydraulic properties, and long-term trends).
- Undertake quality control, quality assurance and interpretation of collected data.
- Monitor water levels in priority aquifers through the Provincial Observation Well Network.
- Support monitoring (surface water and groundwater) to develop and attain water quality objectives and plans.
- Monitor snowpack conditions using automated and manual techniques to support streamflow and flood forecasting.
- Augment inventory of surface water and groundwater data and information through special studies; identify and map areas of vulnerability.
- Develop mechanisms to link and integrate socio-economic information with biophysical water resource information.
- Undertake an updated data requirements, gap analysis and data standards evaluation in relation to changing needs and priorities identified in this strategy.
- Maintain infrastructure and systems that support monitoring, data collection and data processing.

Photo:
Ian Sharpe

Strategy 2.3.2

Validate, manage and provide water resource information

The data collected through WSD's monitoring activities are invaluable tools to support scientific research, planning, decision making and outreach activities. This value is only realized when we can ensure the integrity of the data collected and integrate them with other data to provide useful, reliable information. WSD processes data collected through its monitoring activities, then either enters these data into provincial information management systems or forwards them to our partner agencies for entry. Examples of such systems include the WELLS database, Water Information Data Management (WIDM) system, the Groundwater Observation Well database and the Environmental Monitoring System (EMS).

Activities

The main activities undertaken within this area include:

- Conduct data quality assurance and auditing on water- and snow-related data collected using up-to-date standards.
- Enter data into provincial databases (e.g., the WELLS database, the Water Inventory Data Management (WIDM) system, the corporate Land and Resource Data Warehouse, etc.).
- Investigate, select and implement improved provincial databases.
- Maintain provincial databases under WSD custodianship on an ongoing basis; advise on custodianship of other water-related databases that WSD uses.
- Provide data to support other Division and partner activities through tools such as the Land and Resource Data Warehouse.
- Coordinate with corporate developments led by the Natural Resources Sector Information Council.

Objective 2.4

Leading science informs decision making

A strong scientific foundation ensures credibile decision making for the difficult task of balancing economic development and environmental values. WSD is committed to ensuring that our decisions and information are based on strong science. Under *Living Water Smart: British Columbia's Water Plan*, WSD is leading the development of a Water Science Strategy for B.C. We lead the interpretation and analysis of collected scientific data in several key areas, such as through the River Forecast Centre and through our work to classify the aquifers of British Columbia and characterize the highest priority ones. We also establish water quality guidelines and site-specific water quality objectives with a focus on ecosystem health.

We believe in a proactive and adaptive approach to the stewardship of B.C.'s water. We strive to continually assess the potential impacts of emerging environmental concerns and trends. Problems such as climate change and the mountain pine beetle epidemic will significantly influence surface water and groundwater dynamics in the future. The Division plays a key role in identifying innovative practices to address these challenges and must communicate the science effectively to better inform decision makers.

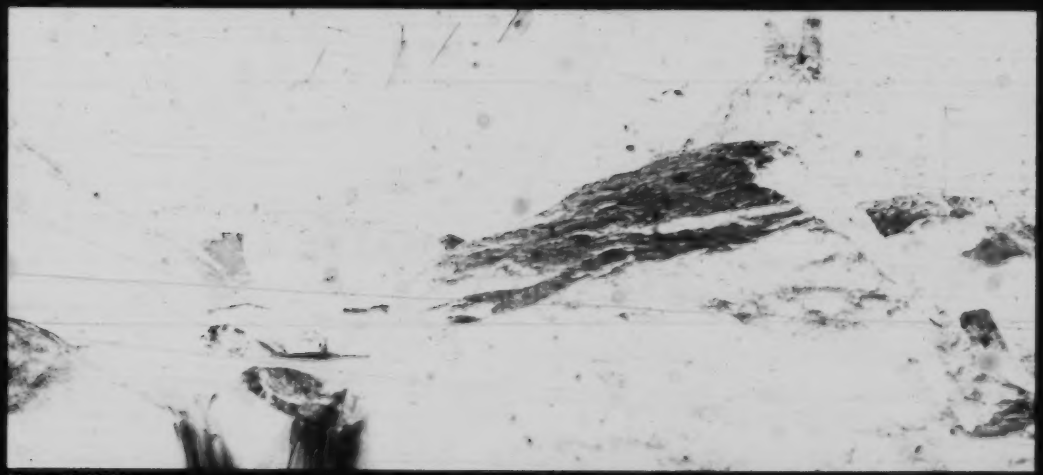


Photo: Ted White

Desired Results

The successful delivery of this objective will result in the following:

- ❶ A Water Science Strategy for B.C. is set and implemented – science and information resources within governments, academia, industry, non-government organizations and private firms are coordinated.
- Stakeholders have a common vision and direction and collaborate on priority issues and opportunities.
- Informed decision making – policies, plans and management practices are well-informed through the timely provision of science-based advice supported by modeling (forecasting), the assessment of alternative scenarios and the quantification of risk.
- Effectiveness evaluation and adaptive management – policies, plans and management practices are monitored and evaluated for their effectiveness and adjusted based on the best available science and information.
- Our fundamental understanding of the variable and dynamic nature of B.C.'s water resources is increased, including the affects of human activities and natural events.
- We can anticipate and respond to new environmental, social and economic trends.
- Risk management and emergency preparedness for extreme weather events are effective and proactive.

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- We must ensure that scientific information is accessible to stakeholders, decision makers and policy makers, in a format that is easily understood and interpreted.
- Effort must be are strategic to ensure that the most pressing scientific issues and questions are addressed.
- As science evolves and new concerns and trends emerge, the training and competencies of WSD staff will need to remain current.
- Science-related activities within the Ministry of Environment, and between ministries, must be continuously coordinated.

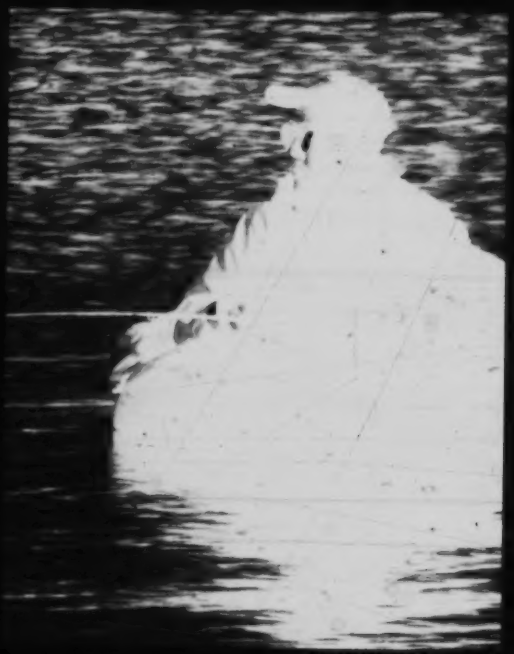


Photo: Kevin Ronneseth

❶ refers to a commitment made in *Living Water Smart*

Strategy 2.4.1

Lead and facilitate the development and implementation of a Water Science Strategy for B.C.

WSD is leading the development of a comprehensive, forward-looking Water Science Strategy for B.C. that aims to identify water science priorities. The Division's relationships with other agencies and academic institutions and its experience in both the social and physical sciences provide a strong advantage for leading this initiative.

Activities

The main activities undertaken within this area include:

- Coordinate and participate in a dialogue among leading water scientists, practitioners and stakeholders in the province to identify key issues, opportunities and strategies and options for these priorities.
- Develop a Water Science Strategy for B.C. and supporting action plan.
- Communicate water science priorities to stakeholders and provide a mechanism for interested parties to remain current on progress.
- Evaluate the potential for an ongoing water science forum for B.C. to provide a venue for the coordination and sharing of leading water science knowledge.
- Regularly review and update the Water Science Strategy for B.C. to reflect the changing environmental setting and new business priorities.

Strategy 2.4.2

Continuously improve and deliver science-based models and forecasts to support planning and decision making

Using data collected by our Division and our partners, WSD conducts modeling and forecasting activities to support planning, risk management and decision making across the province. This includes hydrologic risk and hazard modeling and the work of our River Forecast Centre, which prepares real-time forecasts related to stream flows, water supply (based on snowpack) and flood conditions.

Activities

The main activities undertaken within this area include:

- Develop, refine and maintain hydrologic hazard and risk models to guide development, restoration, community planning and emergency response.
- Deliver seasonal volume forecasts based on meteorological, hydrometric and snowpack data and the use of hydrological models.
- Deliver regular snowpack and water supply commentary to support planning and decision making.
- Provide technical guidance and expertise to partner agencies, municipalities and other organizations involved in planning and emergency preparedness activities.
- Provide technical guidance and expertise in support of provincial emergency response activities.
- Develop groundwater assessment and characterization models to better understand the groundwater resource and its role in the hydrologic cycle.
- Develop and apply new models that provide understanding of the interactions between surface water and groundwater.

Strategy 2.4.3

Translate and communicate scientific knowledge, conduct analysis and support research to guide policy and planning

WSD is involved in regional and site-specific research and monitoring programs to support planning or decision making. This work includes water quality and quantity monitoring and informs decisions regarding water quality objectives, the design of flood protection works and infrastructure investments related to water treatment. Our technical specialists provide guidance and input based on the interpretation of scientific data and use of best practices from across the province and in other jurisdictions. Research and monitoring can also provide answers to specific questions about the current state of water quality and quantity.

Activities

The main activities undertaken within this area include:

- Establish aquifer- or watershed-specific water quality and water quantity monitoring protocols for ecosystem health and guide their implementation.
- Develop provincial water quality guidelines and site-specific water quality objectives in selected watersheds and aquifers to guide land use decisions and ensure ecological health.
- Create a web-based catalogue of different sources of scientific information (e.g., existing internal information, web-based resources, libraries, etc.) so it is handy for accessing the most up-to-date reference material.
- Organize and manage available scientific information simply and efficiently to make it more accessible to staff and others.
- Create a web-based contact list of internal and external science and technical experts in water resource-related disciplines.
- Translate science and the results of research and analysis into information that supports policy and planning, ensuring that it is understandable and broadly accessible.
- Communicate scientific interpretative information in formats suited to the intended audience (e.g., to local governments).
- Provide a strong link between science, planning and decision making ensuring there is effective participation of technical experts in these processes.
- Develop working relationships with other agencies, academia, industry and NGOs to help align priorities and coordinate the overall science and research effort.

Photo:
Darren DeFord

Strategy 2.4.4

Assess emerging water issues and trends on an ongoing basis

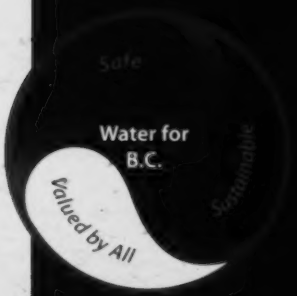
Recognizing that environmental change is continuous, the Division works to address emerging issues that may impact the province's water resource. This includes changing environmental conditions associated with climate change and new patterns of water demand and use across the province. Shifting societal interests and concerns also point to the need to improve the linkage between science, society and decision making. The Division will be forward-looking to ensure that decisions made today do not threaten the long-term health and sustainability of our surface water and groundwater resources. We will also work to prepare for future environmental changes.

Activities

The main activities undertaken within this area include:

- Undertake regular strategic foresight analyses to examine broad-ranging emerging environmental, technological, sociological and economic trends and drivers.
- Assess hydrologic and aquatic implications of the mountain pine beetle epidemic.
- Assess potential impacts on groundwater related to geothermal heating and coalbed methane gas extraction.
- **O** Assess the impacts of climate change on the water cycle and risk of flood and drought; ensure this information is available to water management and decision making processes.
- Identify and assess the impacts of emerging water quality concerns (e.g., pathogens, endocrine disruptors, pharmaceuticals, algal toxins, etc.).
- Assess the potential impact of droughts and low-flow conditions on water stressed regions of the province (e.g., the Okanagan Region, the Gulf Islands) or where climate change will likely have a greater natural impact.
- **O** Develop tools to incorporate traditional ecological knowledge into decision making.
- Communicate about water science and enhance the relationship among government, society and science in managing the water resource.
- **O** Look at new ways to help promising water conservation technology succeed.

O refers to a commitment made in *Living Water Smart*



Objective3.1

British Columbians recognize the many values of water and share responsibility for stewardship

Water Stewardship Division promotes the value of water to all British Columbians. We seek to foster a shared understanding of its true value in terms of its role in economic development, the provision of drinking water and in maintaining healthy ecosystems. Water makes a valuable contribution to our economy and we need to know more about where, when and how people are using it. Water use efficiency is a major component of *Living Water Smart: British Columbia's Water Plan*, and WSD will play a key part in achieving its commitments. Recognizing the role of all stakeholders as stewards, we aim to ensure that all residents have sufficient information and support to use water wisely.

Photo: Lynn Kriwoken

Desired Results

The successful delivery of this objective will result in the following:

- All British Columbians recognize the intrinsic value of water for themselves and their communities.
- Water use in British Columbia is 33 percent more efficient by 2020.
- Fifty percent of new municipal water needs are acquired through conservation by 2020.
- All sectors reduce water consumption, resulting in a decrease in waste, reduced severity of water shortages and reduced infrastructure needs.

Photo: Donna Moreau

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- Public concern over water quality and quantity has recently declined relative to other environmental matters.
- Water use is often considered a right; users are accustomed to paying a low amount for that right relative to the benefit they receive.
- The mechanisms for effectively quantifying the tangible and intangible value of water are poorly developed.
- The "myth of abundance" means that the value of water is not always fully appreciated.
- Some users resist water efficiency measures due to cost considerations (e.g., the cost of new water-efficient technology).
- Most water use is not metered, even in urban settings.
- Groundwater extraction is not licensed and the value of this resource is often undervalued and poorly understood.
- Many people have a poor understanding of groundwater movement and processes.

Photo: Donna Moreau

refers to a commitment made in *Living Water Smart*

Strategy 3.1.1

Improve understanding of the value of water to British Columbia

Water is precious, yet is consistently undervalued. We have a poor understanding of the resource's quantifiable role in the economy of the province. Since understanding the tangible and intangible value of water is critical to stewardship, the Division will lead investigations into the contribution that water makes to the provincial economy. We will also continuously review our revenue model to ensure that our collection of water licence rent keeps pace with the cost of managing the resource. Finally, we will continue to engage in ongoing dialogue with British Columbians regarding the economic, social, environmental and intrinsic value of water through marketing communications and other tools.

Activities

The main activities undertaken within this area include:

- Support efforts of partners in other ministries and divisions to improve water education though use of stream health assessments, youth water science prizes and scholarships, and by providing summer jobs to undertake restoration projects.
- Complete a baseline study into the contribution water makes to the economy of B.C.
- Review revenue models so that rent collection reflects the full cost of managing the resource.
- Use outreach tools to communicate with British Columbians about the intrinsic value of water to our identity, culture and spiritual values.
- Support annual water awards for individuals or groups to celebrate successful water stewardship.
- Support partners in other agencies to use sports and the Olympic Games to engage British Columbians to make smarter water choices.
- Publish a report on the state of our water by 2012 and every five years after that.

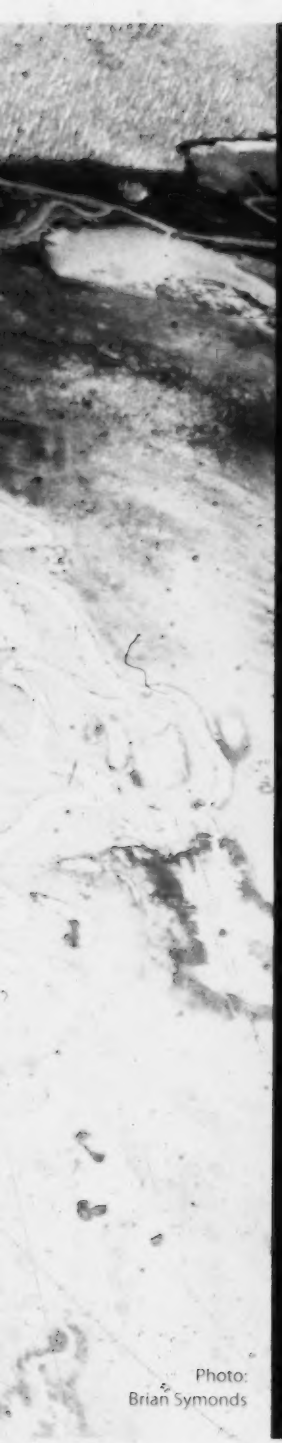


Photo:
Brian Symonds

Strategy 3.1.2

Develop and implement a provincial water demand management strategy

Under *Living Water Smart: British Columbia's Water Plan*, government has set targets of improving water efficiency in B.C. by 33 percent and meeting 50 percent of new municipal needs through conservation by 2020. WSD contributes to these desired outcomes in two ways. First, we will work directly with water licence holders to help them use allocated water as efficiently as possible. Second, we work with our partners in local government and elsewhere to encourage efficiency among water users that do not have licences. Our demand management strategy will use the full range of tools, including community-based social marketing, promoting new technology, compliance and enforcement, and effective water pricing. We also need to better understand how water is currently used.

Activities

The main activities undertaken within this area include:

- Complete a baseline study on current water consumption in B.C. across all sectors (residential, industrial, agricultural, public, etc.).
- Complete a comprehensive water demand management strategy that considers the full range of tools (pricing, outreach, incentives, technology, compliance and enforcement, etc.).
- **O** Work with the sector and partners in the Ministry of Agriculture to require more efficient agricultural water use while also securing access to water for agricultural lands.
- Through collaborative arrangements, provide Best Management Practices to local governments and water purveyors for demand management programs and activities.
- **O** Require all large water users to measure and report their water use.
- Investigate the benefits and barriers to introducing water demand management terms and conditions in water licences.
- **O** Work with other provinces to share ideas and resources to improve water conservation and collectively help communities adapt to climate change.
- **O** Support efforts of partners in other agencies to develop a water efficiency labelling system for water consuming products.
- Work with partners in the ministry on compliance and enforcement with licensees to ensure that quantity diverted does not exceed allocated rights.
- Work with private water utilities to improve water use efficiency in their operations and with their customers.

O refers to a commitment made in *Living Water Smart*

Water for B.C.

Valued by All

Objective3.2

Water stewardship is integrated into the decisions and actions of other agencies and entities

Water stewardship is shared across all levels of government, community groups, the private sector and with every resident. Within the provincial government, responsibilities for monitoring, planning, decision making and compliance and enforcement are shared across multiple ministries and divisions. Caring for water is a collective responsibility. Many people and institutions must lend a hand. This arrangement allows us to apply a broad range of expertise and knowledge to water management. However, it also requires that all parties are aligned and that stewardship efforts are coordinated. WSD plays an important role in the development of integrated land and water use policies and planning processes by representing the water resource at local, provincial and federal policy making forums.

Many rivers, streams and aquifers also cross provincial and national boundaries (e.g., the Liard, Tatshenshini, Stikine, Peace and Columbia rivers and the Grand Forks aquifer). WSD will continue to participate in national, inter-provincial, and international processes and in the negotiation of trans-boundary water agreements.

Photo: Barry Penner

Desired Results

The successful delivery of this objective will result in the following:

- Water management is actively considered in local, provincial and national policy making and planning forums.
- Water management and stewardship efforts are well resourced.
- The public is confident in Government's management of water.
- Planning and decision making related to water are efficient and all parties are satisfied with the outcomes.
- Water health and security considerations are considered in local government planning and development programs.

Identified Challenges

Success in undertaking our role within this area is dependent on the Division confronting the following challenges:

- Fragmented and inconsistent incorporation of water issues in policies and decision making.
- Mixed awareness of policy and regulatory processes that impact the water resource.
- Lack of shared data and information about the water resource can lead to uncertainty in decision making.

Photo: Kevin Ronneseth

O refers to a commitment made in *Living Water Smart*

Strategy 3.2.1

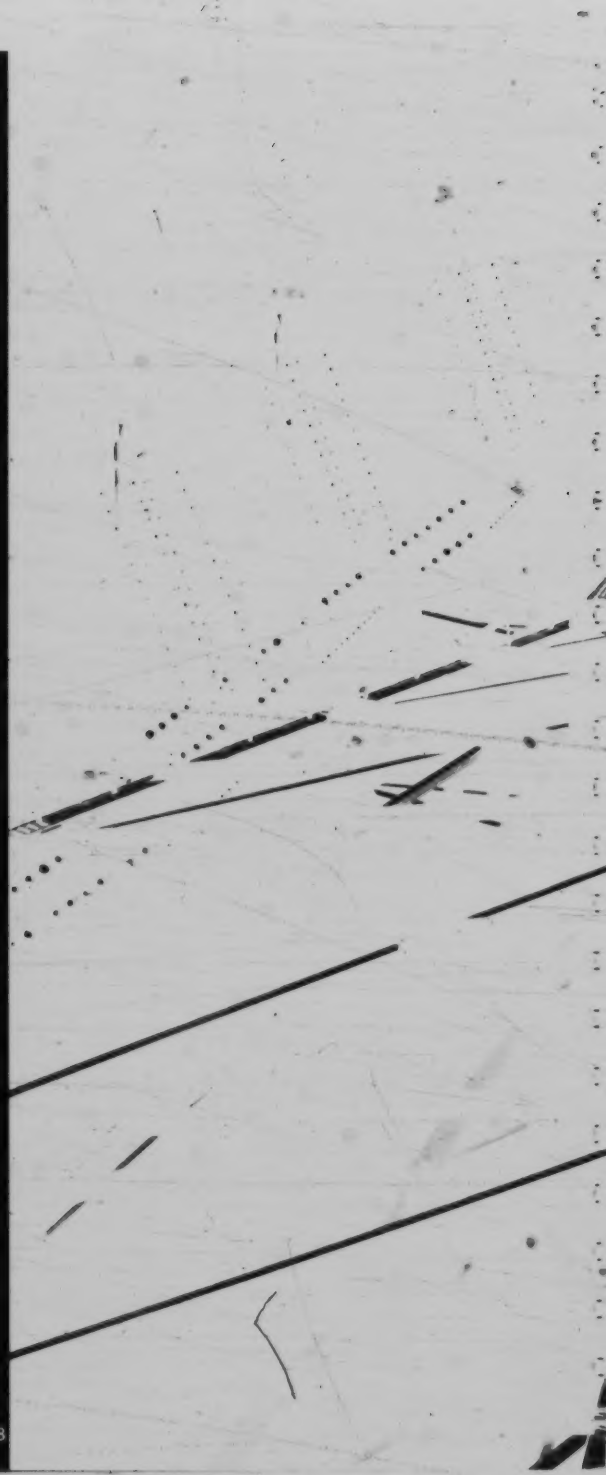
Participate effectively in multi-party policy making that affects the water resource

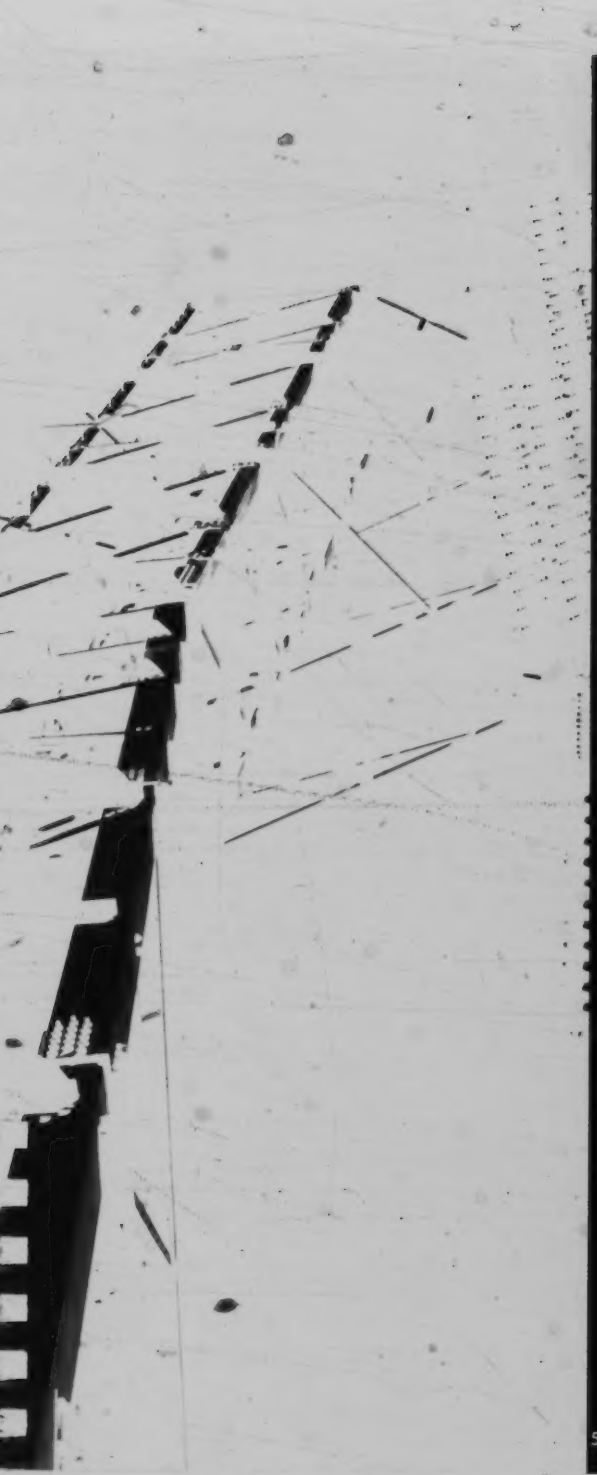
WSD will contribute to effective policy making around water across the provincial government and other governments and agencies, whether related to human health, industry development, or maintaining ecosystem function. To do so, we will develop clear and comprehensive polices and ensure that our staff have the necessary skills and direction to effectively represent the Division.

Activities

The main activities undertaken within this area include:

- Participate in cross-government working groups and decision making processes that affect water (e.g., Regional Drinking Water Teams; Inter-Agency Management Committees).
- Where appropriate, negotiate Memoranda of Understanding (MOUs) and Service Level Agreements (SLAs) with other agencies to establish day-to-day procedures and smooth operations where regulatory and administrative roles are shared (for example, with the B.C. Oil and Gas Commission).
- Audit multi-agency activities around water to clarify roles and identify duplication.
- Share databases and information on water with partners in other agencies and entities; work with the federal government and other ministries to develop data sharing standards.





Strategy 3.2.2

Protect British Columbia's interests in inter-provincial, national and international negotiations affecting trans-boundary water management

Where water systems and aquifers cross provincial and national borders, the Division will work with partners to ensure that the Province's interests and the water resource are protected. This involves participating in inter-jurisdictional policy making and planning forums, providing information and technical expertise, and in some cases, providing financial and other resources.

Activities

The main activities undertaken within this area include:

- Continue to work with other members of the Mackenzie River Basin Board to effectively manage water in that region.
- Work with the Governments of Alberta, the Yukon and the Northwest Territories to develop Bilateral Water Management Agreements under the Mackenzie River Basin Trans-boundary Waters Master Agreement.
- Participate in the North American Waterfowl Management Plan and its supporting Joint Ventures to ensure healthy wetlands and other aquatic habitat.
- Continue to work with the federal government and BC Hydro, through forums such as the Permanent Engineering Board, on any required future negotiations related to the Columbia River Treaty.
- Represent British Columbian interests on the International Osoyoos Lake and Kootenay Lake Boards of Control to ensure these lakes are regulated in compliance with the Orders of the International Joint Commission.

WHERE TO FROM HERE?

Where to from Here?

This plan sets out an ambitious course of action for the Division, its staff and the Ministry. We are committed to its successful delivery and see it as a vital tool to help us realize our vision. It provides us with clear focus and direction which will be used regularly through the annual work planning and EPDP processes and as a reference document. We hope that this plan provides insight into our business for all our partners and stakeholders.

Implementing this plan will involve hard yet rewarding work. We hope it helps us to align our workloads with the Division's priorities. To assist us in managing our performance, we will employ Ministry tools, processes and procedures such as those contained within the Performance Management Framework to understand how we are doing. The WSD Management Committee is also committed to embedding the plan in the organisation. This will involve improving our core processes of priority setting, annual planning and performance monitoring.

This plan is the result of tremendous effort on the part of many individuals from across the province within the Division and the Ministry. We thank them for investing their time and for utilizing the depth and breadth of their knowledge and experience to generate a plan that we take forward with pride and confidence.

Water for B.C.:
Safe, Sustainable and Valued by All

Appendix 1:

Water Stewardship Division's Partners

WSD is the lead agency for water stewardship in B.C. However, we cannot achieve our vision without the support of our valued partners in federal and provincial government agencies, local government, First Nations, community groups, academic institutions, and industry associations. The table below describes some of the organizations we work with on a regular basis, and provides an overview of the role that each fulfills.

Agency/Organization		Water Responsibilities
Provincial	Ministry of Healthy Living and Sport Centre for Disease Control Regional Health Authorities	Mandate for drinking water protection under the *Drinking Water Protection Act*. The Interagency MOU for the Protection of Drinking Water commits all provincial agencies to consider drinking water protection in their statutory decisions and approvals. Drinking Water Protection Officers have statutory authority to ensure potable water supplies are protected.
	Ministry of Agriculture and Lands	Supports agricultural industry water requirements used in the production of food and other agricultural products.
	Integrated Land Management Bureau	Considers water in regional land and resource planning.
	FrontCounter BC	Front Counter BC provides single-window service where clients can obtain information on water licences and approvals and also assists with processing their applications.
	Ministry of Energy, Mines and Petroleum Resources	Develops energy policy and works to sustainably support industry water requirements.
	Oil and Gas Commission	Issues approvals for short-term use and for changes in and about a stream in connection with authorizations for oil and gas development.

***Note:**
This list is not comprehensive and may not detail all water stewardship activities of organizations.

	Agency/Organization	Water Responsibilities
Provincial	Ministry of Forests and Range	Manages and protects water as a forest resource under the *Forest and Range Practices Act*.
	Ministry of Community Development	Provides water infrastructure and planning funding and supports regional growth strategies that consider future water supply. Oversees local government activities under the *Local Government Act*.
	Ministry of Public Safety and the Solicitor General	Coordinates response to water related emergencies such as floods, and provides funding to mitigate those hazards.
	Ministry of Aboriginal Relations and Reconciliations	Leads the negotiation of treaties that consider water as a resource of interest.
	Ministry of Transportation and Infrastructure	Approves rural subdivision developments, including assessing potential risks and obstacles involving water supply and sewage disposal.
	Environmental Assessment Office	Coordinates the assessment of proposed major projects under the *Environmental Assessment Act* to ensure they are conducted in a sustainable manner.

	Agency/Organization	Water Responsibilities
Federal	Environment Canada	Operates hydrometric, climate and water quality networks, in partnership with the provincial Ministry of Environment. Undertakes research in water quality and quantity, watershed management and climate change.
	Fisheries and Oceans Canada	Administers the *Fisheries Act*, which protects anadromous and marine fish habitats.
	Indian and Northern Affairs Canada (INAC)	Jointly manages water with First Nation governments on Indian Reserves
	Health Canada	Sets drinking water quality standards for Canadians
	Agriculture Canada	Conducts research and provides information regarding water use in agriculture, and agricultural impacts on the water resource.
	Transport Canada	Regulates transportation on water (rivers, lakes).
	Natural Resources Canada	Conducts research on groundwater and hydrologic impacts of climate change.

Photo: Kevin Rempeseth

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Produced by Tanneseth

Agency/Organization	Water Responsibilities
Local Government	• Manages municipal water supplies. • Responsible for floodplain management under the Flood Hazard Statutes Amendment Act. • Undertakes local water conservation programs. • Responsible for local land use planning and development on private lands. • Local governments and diking authorities are responsible for the operation and maintenance of flood protection infrastructure in their local areas. • Some local governments undertake their own watershed and water supply planning.
First Nations	• First Nations have deep historical, cultural and spiritual connections with water. Many consider water to be the "lifeblood of the land". • First Nations are one of the largest groups of water licence holders in the province, with over 700 active licences attached to Indian Reserves for all purposes (held either jointly by First Nations and INAC or individually by bands). • Many First Nations are negotiating treaty provisions involving substantial water rights to provide for community development.
Industry	• Continued economic prosperity is dependant on access to reliable and secure water supplies. Industry across B.C. relies on water as a vital component of production. • Many industries are displaying leadership in water stewardship and are setting an example for others to follow. • Industry and professional associations such as the BC Water and Wastewater Association, the BC Ground Water Association, and the Canadian Water Resources Association provide key advice on water policy and facilitate discussion and knowledge sharing among water users and water resource professionals.
BC Hydro	• The largest water licensee in the province, with operations that depend on reliable, carefully managed water supplies. • Works to reduce the need to expand hydropower operations by encouraging consumer energy conservation. • Develops Water Use Plans, which modify hydro dam operations to mitigate their impact on downstream fish habitat and other values.

Agency/Organization	Water Responsibilities
Academic Institutions	• Conducts critical research on water quality and quantity, the impacts of climate change, watershed functioning, groundwater and aquifer function, governance policy, demand management and numerous other topics. • Provides training to those who may become future members of our team.
Community Organizations and Individuals	• Individuals and organizations provide vital services through outreach, conservation, restoring source water and maintaining or bringing back aquatic habitat. • New, collective shared stewardship approaches enables the public to take on greater responsibility for securing a sustainable water future. WSD supports water user communities and watershed groups across the province by working to build local capacity and by recognizing success. • Watershed councils such as the Fraser Basin Council and the Okanagan Basin Water Board work to advance sustainability across local and regional watersheds, help to resolve stakeholder conflicts and educate the public about water issues.

Photo: Roberta Patterson

Appendix 2:

Provincial and Federal Water Legislation in British Columbia

The legal framework for managing water in British Columbia is not limited to just the provincial *Water Act*. Many other provincial, federal and local government laws govern various matters relating to water.

A summary of these Acts can be found at: www.env.gov.bc.ca/wsd/water_rights/overview_legislation/index.html

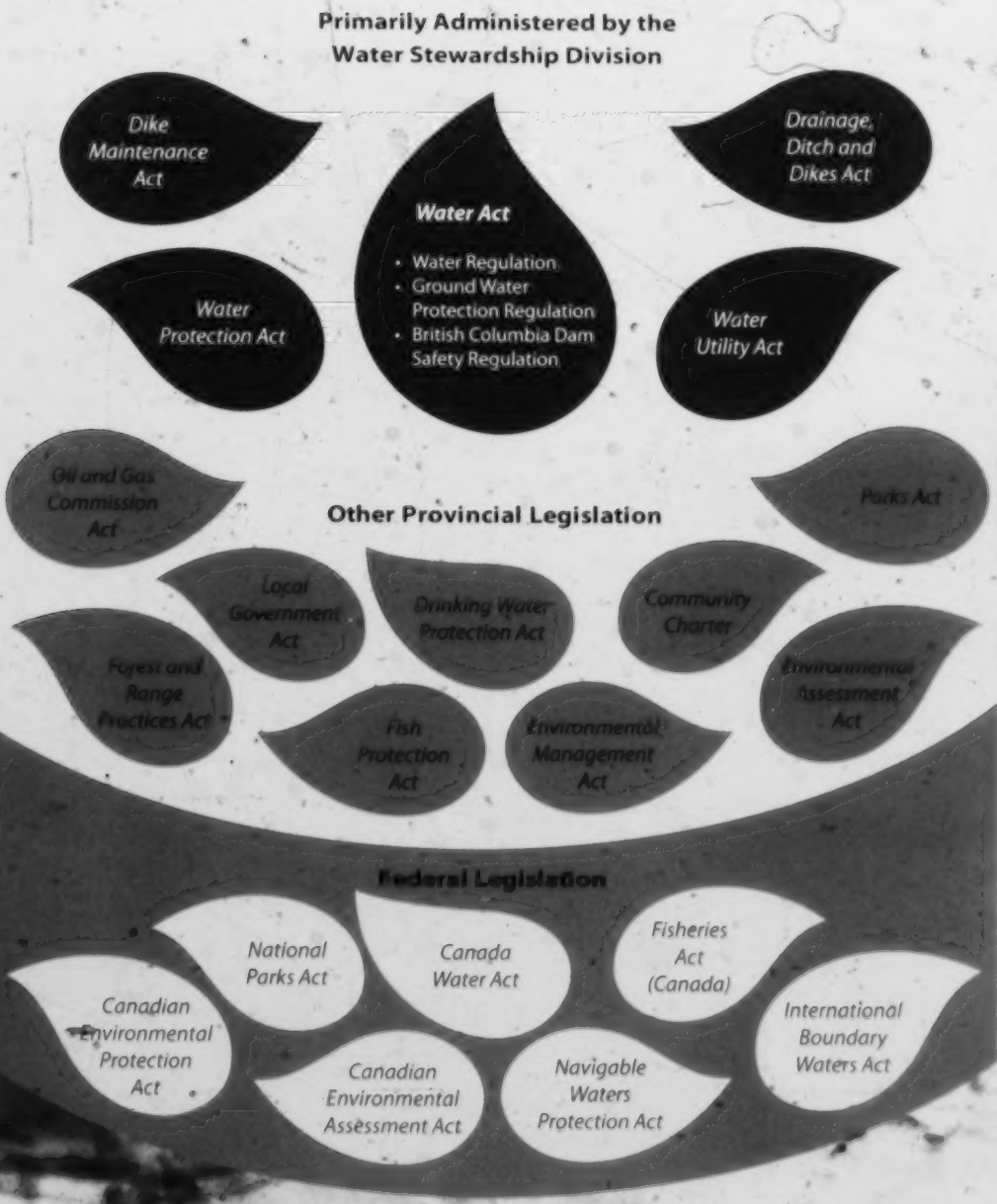

Photo: Kevin Ronneseth

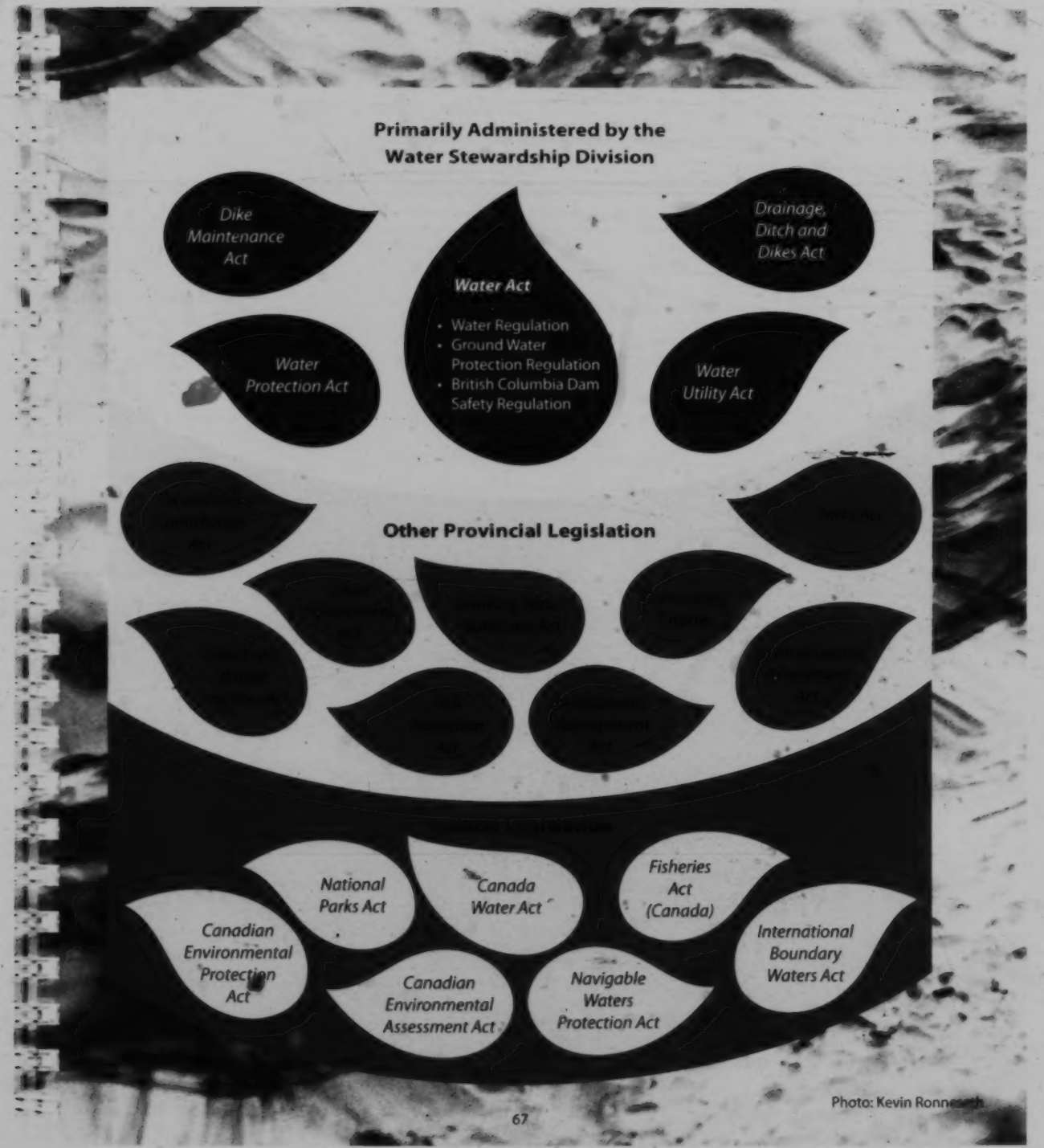

Photo: Kevin Ronneseth

Appendix 3:

Major Rivers and Watersheds in British Columbia

Source:
ILMB Land Resource Data Warehouse (May 2008).

Drainage of Major Rivers

River	Drainage Area (km^2)	Length (km)	Average Annual Discharge (m^3/sec)
Fraser	231,312	1,368.5	3,600
Liard	143,418	483.0	1,300
Peace	128,451	281.7	1,400
Columbia	103,004	750.3	2,800
Skeena	54,488	579.6	1,000
Stikine	50,362	539.3	1,000
Nass	20,839	378.3	900

Source: McGillivray, B. (2000) *Geography of British Columbia: People and Landscapes in Transition*, UBC Press.

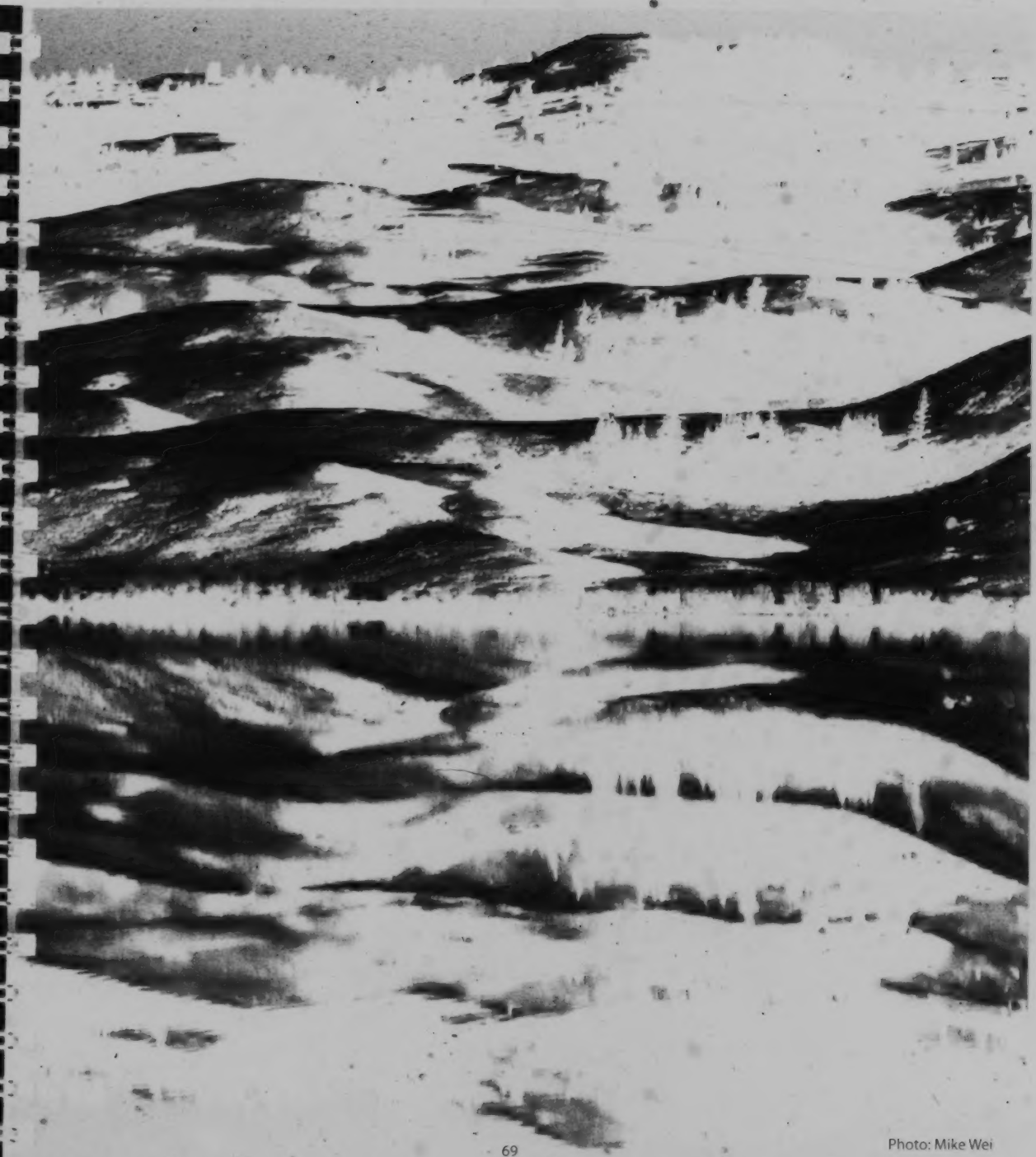

Photo: Mike Wei

Appendix 4:

Aquifers at Risk in British Columbia

Increased understanding of local aquifers is key to managing and protecting local groundwater resources. At present, approximately 900 aquifers have been identified and classified across British Columbia. Generally these are in developed areas, although there are many more in the province. Of these classified aquifers, approximately:

- 53 aquifers have documented water quality concerns. Most of these are in the Southern Interior, the east coast of Vancouver Island, the Lower Mainland or on the Gulf Islands.
- 35 aquifers reported elevated saline levels, often the result of excessive groundwater withdrawals in coastal regions that causes sea water intrusion.
- 28 aquifers are considered heavily developed and highly vulnerable to contamination. Many of these supply drinking water to large communities, such as Langley, Abbotsford, and Prince George.
- 27 of the heavily developed aquifers also have a documented quality and or quantity concerns.

Source:
Environmental Trends in British Columbia (2007).

Aquifers Vulnerable to Contamination or with Reported Water Quality Concerns

Source:
Ministry of Environment, Water Quality and Sediment Quality Monitoring Reports (2007).

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Aquifers Vulnerable to Contamination or with Reported Water Quality Concerns

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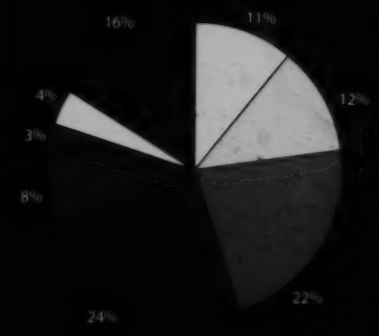
APPENDIX 4

Photo: Mike Wei

Appendix 5:

Water Licensing in British Columbia

Figure 1 - Active Water Licences in British Columbia by Region

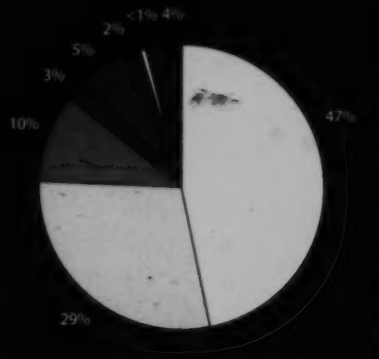


Region	Water Licences
Vancouver Island (Nanaimo)	4,819
Lower Mainland (Surrey)	5,315
Thompson/Nicola (Kamloops)	9,595
Kootenay (Nelson Cranbrook)	10,750
Cariboo/Chilcotin (Williams Lake)	3,340
Skeena (Smithers)	1,474
Omineca Peace (Prince George)	1,544
Okanagan (Penticton)	7,152
Total	43,989

Source:
WLIS Report 2500 (2008).

Figure 1 illustrates how B.C.'s 43,989 water licences are distributed spatially across the province's regions.

Figure 2 - Licences and Applications by General Purpose



General Purpose	Water Licences and Applications
Domestic	24,347
Irrigation	14,787
Industrial	5,097
Waterworks	1,618
Storage (Non-power)	2,674
Waterpower*	1,144
Storage (Waterpower)	116
Other	2,039
Total*	51,822

Source:
WLIS Report 2500 (2008).

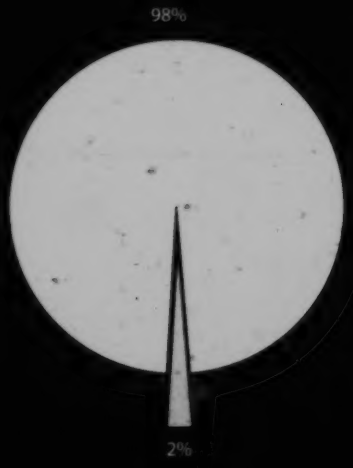
***Note:**
Waterpower includes all power purposes: general commercial and self-supplied residential.

The total shown here (51,822) is higher that the approximate number of active water licences (43,989), as it includes all purposes which may be authorized by a licence. For example, a single water licence may authorize up to 3 water use purposes.

Figures also include applications in process.

Figure 2 illustrates how water licences are distributed by purpose. Domestic licences account for nearly half of all existing licences. However, this sector accounts for only a small portion of total water use, given that each individual domestic licensee tends to withdraw a low volume.

Figure 3A - Surface Water Use by Volume in British Columbia

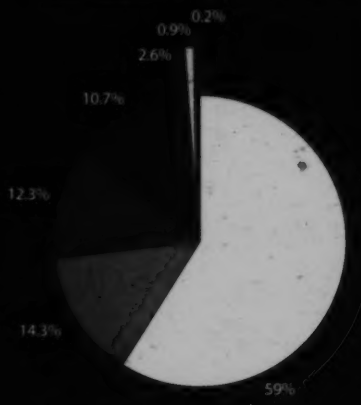


Sector	Annual Allocated Volume (megalitres)
Waterpower*	592,908,100
Remaining Water Uses	14,650,692
Subtotal	607,558,792
Storage (not graphed)	99,549,050
Total	707,107,842

Source:
WLIS Licence Data (May 2006), converted to metric.

***Note:**
includes commercial, general and residential waterpower.

Figure 3B - Surface Water Use by Volume (excluding waterpower)
(Breakdown of non-waterpower allocation)



Region	Annual Allocated Volume (megalitres)
Agriculture	1,566,849
Aquaculture (fish hatchery)	384,800
Conservation and Land Improvement*	8,642,800
Domestic	33,782
Industrial and Commercial*	2,101,111
Mining and Petroleum	125,332
Waterworks	1,796,019
Total	14,650,692

***Note:**
Conservation and Land Improvement also contains 525 authorizations for the total flow of the source of water supply. As these volumes are not recorded in the database, they are not included in this estimate.

Industrial and Commercial also contains 57 total flow authorizations which are not included in this estimate.

Figure 3A shows that, in comparison to all other sectors, the waterpower industry accounts for the vast majority of all licensed use by volume. However, it should be borne in mind that most water use by this sector is non-consumptive "flow through" use for the generation of hydro power.

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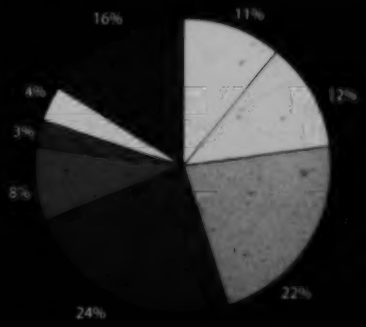

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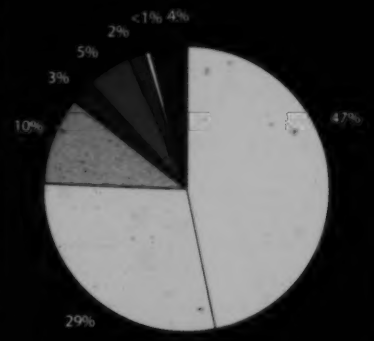

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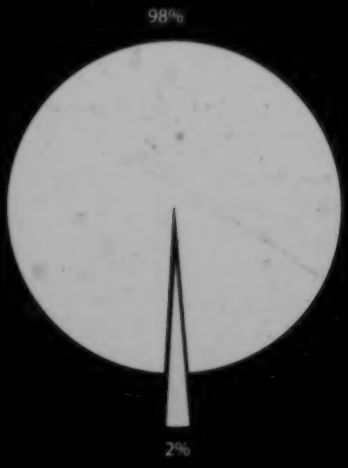

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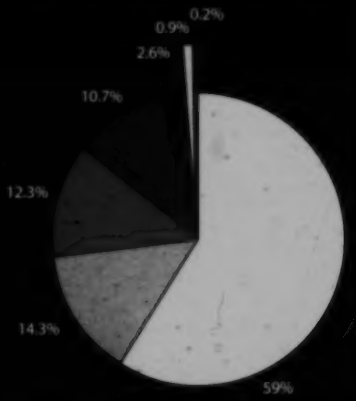

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Figure 4 - Water Licence Revenue in British Columbia

Region	Revenue in Millions
BC Hydro	278
Other Major Hydro Client	37
160 Minor Hydro Clients	1
General Rentals	5.8
Miscellaneous Revenue	2
Local Authorities	0.9
Total	324.7

Source:
WaRMS Billing Report (April 2008).

Other Major Hydro Clients include: Alcan, Cominco, CPC, and Fortis.

General Rentals inlcudes the majority of non-hydro power production water licences (e.g. domestic, irrigation, industrial, commercial, mining, oil and gas etc.).

Miscellaneous Revenue includes water licence application fees.

Local Authorities includes major supplies of water by waterworks system and irrigation districts.

Figure 4 illustrates that, corresponding to the large volumes of water it uses, the waterpower sector accounts for most of the water licence revenue in the province.

Water Allocation Restrictions and Water Reserves

Water Allocation Restrictions

A Water Allocation Restriction is a management tool. They are assigned by Water Stewardship Division staff when an investigation indicates that a water source is nearing or has reached full allocation. Restrictions may range from including minimum fish flow clauses in a water licence to suspending the issuance of any further licences on a given water body.

Water Reserves

A Water Reserve is a way to set priorities for future allocation of water from a stream or a drainage system. They are established by Order-in-Council and withhold all or part of the unrecorded water from being diverted and used under a water licence.

Figure 5 - Distribution of Water Allocation Restrictions and Water Reserves in British Columbia

Source:
ILMB Land and Resource Data Warehouse (2008)

Figure 4 - Water Licence Revenue in British Columbia

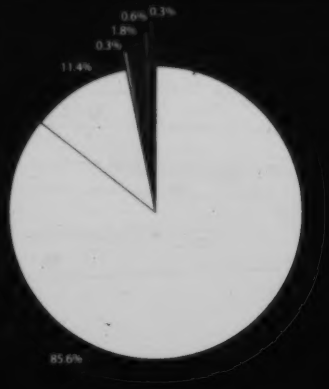

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Photo: Bert Brazier

Appendix 6:

Private Water Utilities in British Columbia

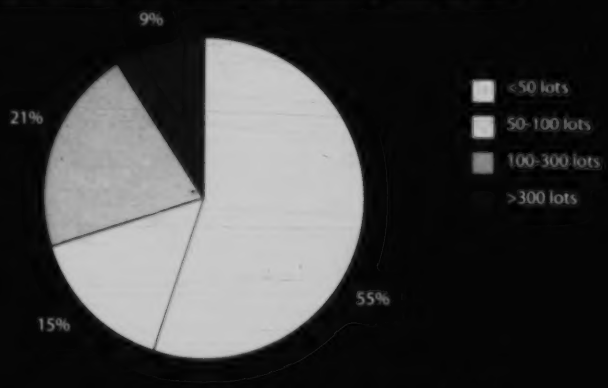
Currently there are over 160 private water utilities in British Columbia under regulation of the Comptroller of Water Rights serving approximately 20,000 households and businesses.

Distribution of Private Water Utilities in British Columbia

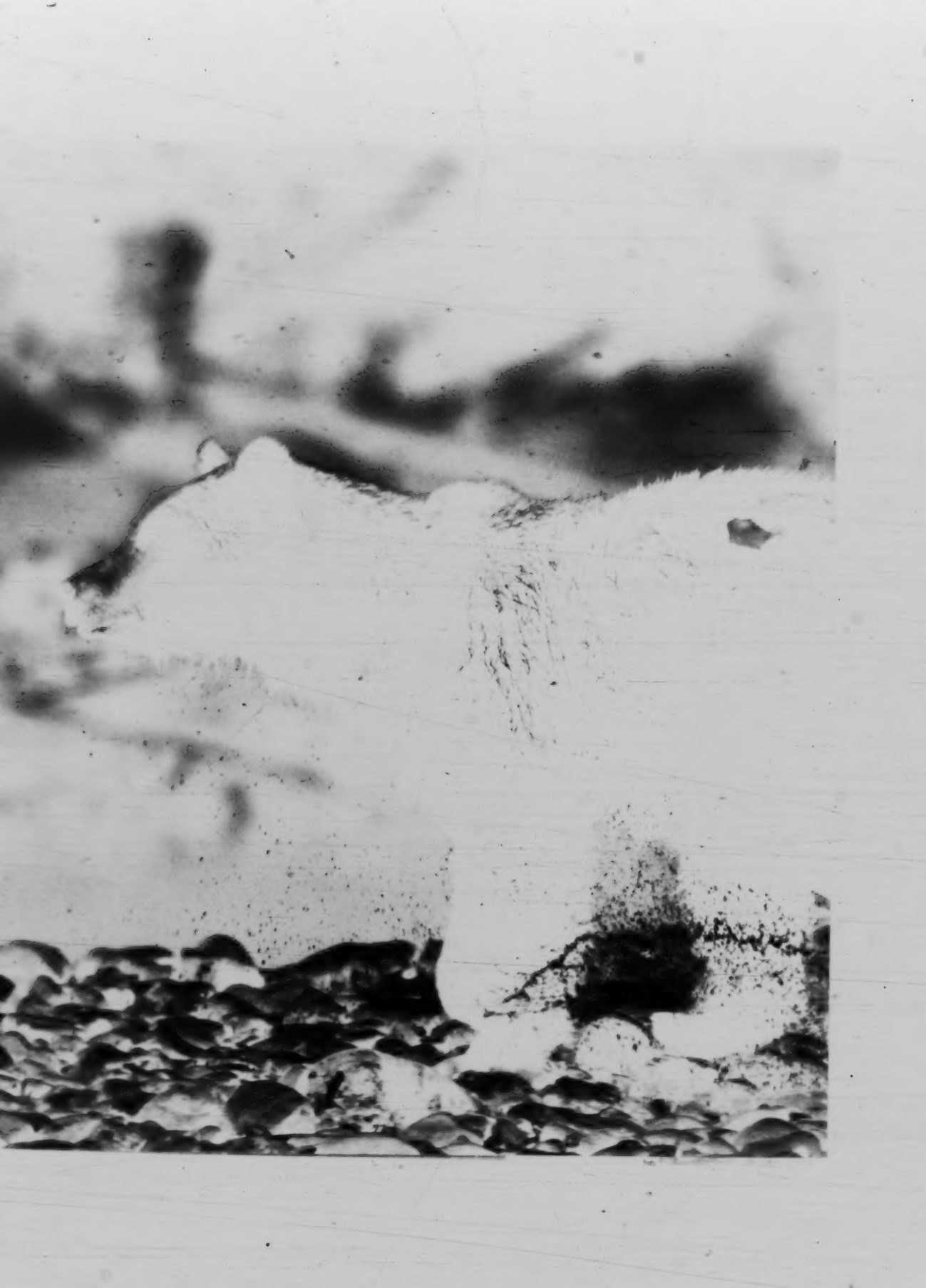
Source:
ILMB Land and Resource Data Warehouse (2008).

Most of the private water utilities under regulation have less than 100 connections. However, two serve the City of White Rock (with 7,000+ connections) and 1,500 residential and commercial customers between Parksville and Quallicum Beach.

B.C.'s Private Water Utilities by Number of Lots Served



Source:
Water Utilities Database, Water Utilities Section WSD Produced (April 2008).



Appendix 7:

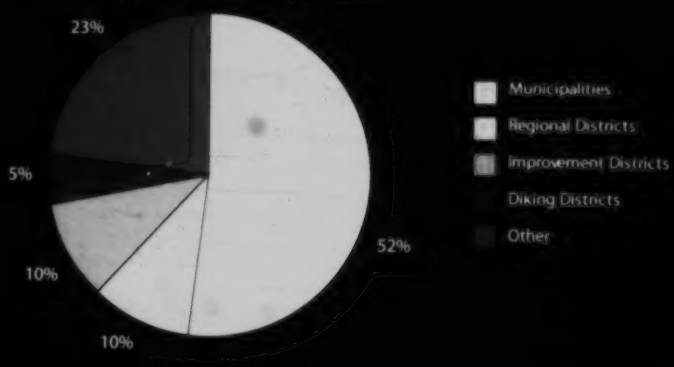
Dike Safety and Flood Protection

The *Dike Maintenance Act* was amended and updated in 2003. It empowers the Water Stewardship Division to set standards for dike construction, approve changes to dikes, and require diking authorities to submit annual inspection reports and to maintain dikes. Administration of the Act is assisted by delivering educational outreach and providing technical assistance to diking authorities. Water Stewardship Division is also responsible for operating and maintaining provincial works and the managing of risks associated with orphan works.

Facts on Flood Protection in B.C.

- 110 diking authorities (local governments, diking districts, crown agencies, etc.) own and operate over 200 dikes and ancillary works, with a replacement value of over $1 billion.
- The 1,100 kilometres of dikes in B.C. protect 160,000 hectares of land and approximately 100,000 buildings.
- 100 orphan works, which are not maintained by a diking authority, total more than 85 kilometres in length and provide protection for 75 communities.
- There have been more than 40 documented dike failures in British Columbia since 1894 (Flood Protection Works Inspection Guide, 2000).
- In 2002, it was estimated that large flood and dike failures in the Fraser Valley could cause over $6 billion in flood damage.
- Ongoing inspection and maintenance of dikes is critical to dike performance.

Diking Authorities in British Columbia



Source:
WSD Flood Safety Section (April 2008).

APPENDIX 7

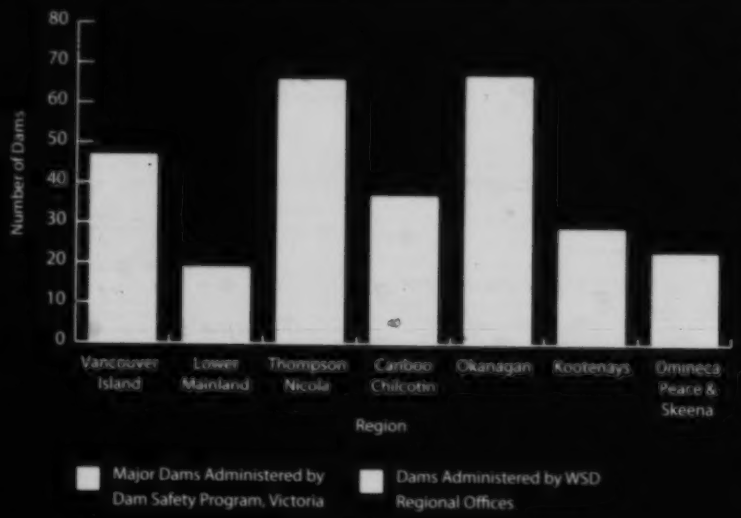
Photo: Golder Associates

Appendix 8:

Dam Safety in British Columbia

Dams in British Columbia are classified in terms of the consequence of failure, based on the incremental losses that might be inflicted on downstream or upstream areas or at the dam if it failed.

Dams of High or Very High Consequence of Failure in British Columbia



***Note:**
A "major "dam is defined as a dam structure of 9 metres or greater in height. These dams are administered by the Dam Safety Program based in Victoria.

Source:
WLIS Dam Module (April 2008).

Classification of Dam Consequence

Rating	Loss of Life	Economic and Social Loss	Environmental and Cultural Losses
Very High	Large potential for multiple loss of life.	Very high economic losses affecting infrastructure, public and commercial facilities in and beyond inundation area.	Loss or significant deterioration of nationally or provincially important fisheries habitat.
High	Some potential for multiple loss of life.	Substantial economic losses affecting infrastructure, public and commercial facilities in and beyond inundation area.	Loss or significant deterioration of nationally or provincially important fisheries habitat.
Low	Low potential for multiple loss of life.	Low economic losses to limited infrastructure, public and commercial activities.	Loss or significant deterioration of regionally important fisheries habitat.
Very Low	Minimal potential for multiple loss of life.	Minimal economic losses typically limited to owner's property.	No significant loss or deterioration of fisheries habitat.

Source: Dam Safety Regulation

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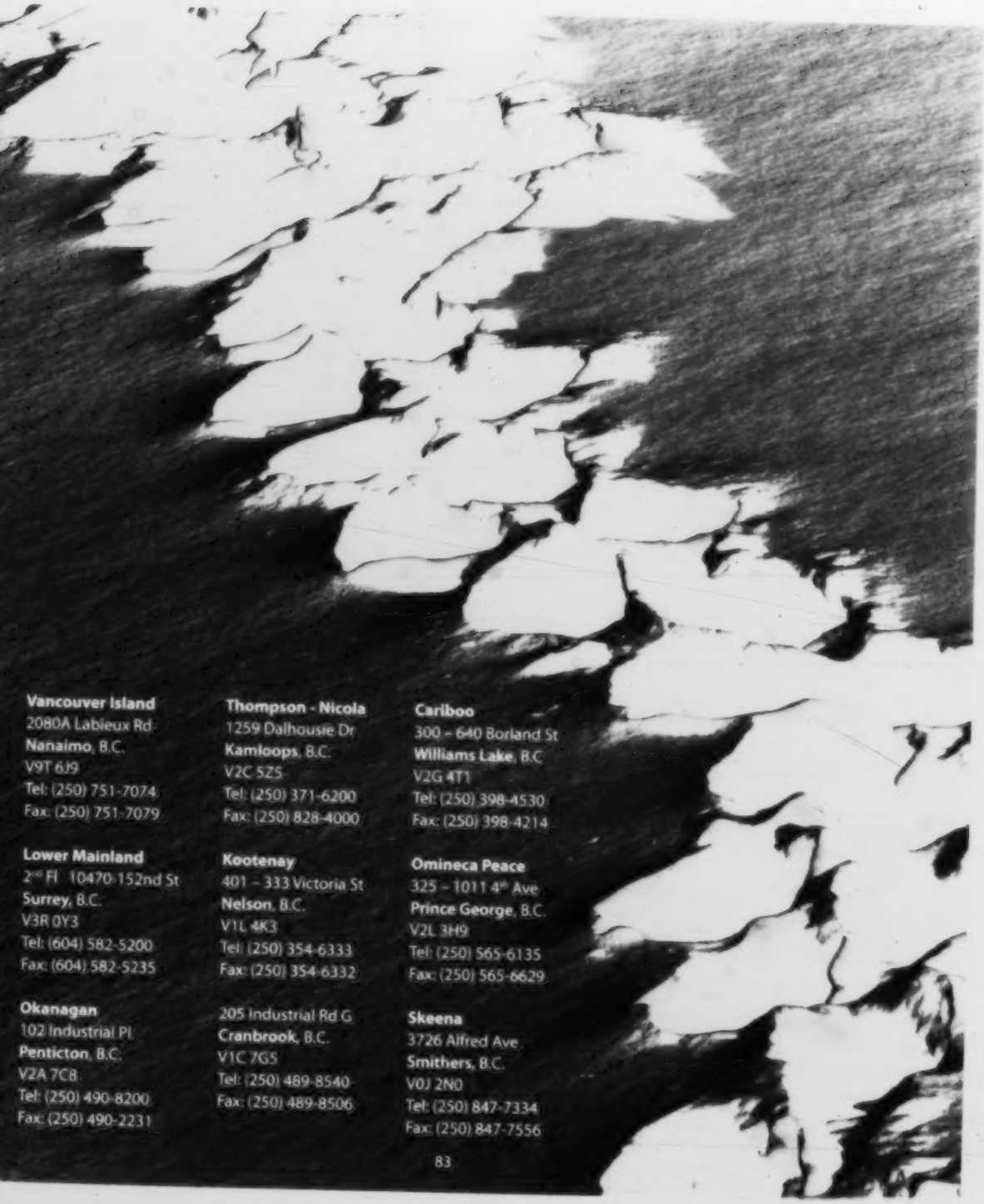
Photo:
Antoine Benault

C

APPENDIX 9

Appendix 9:
Regional Offices and Water Management Boundaries
Smithers
Prince George
Williams Lake
Kamloops
Penticton
Nelson
Cranbrook
Nanaimo
Surrey
Water Stewardship Division Office
Water Region Boundary



Vancouver Island
2080A Labieux Rd
Nanaimo, B.C.
V9T 6J9
Tel: (250) 751-7074
Fax: (250) 751-7079

Lower Mainland
2nd Fl 10470-152nd St
Surrey, B.C.
V3R 0Y3
Tel: (604) 582-5200
Fax: (604) 582-5235

Okanagan
102 Industrial Pl
Penticton, B.C.
V2A 7C8
Tel: (250) 490-8200
Fax: (250) 490-2231

Thompson - Nicola
1259 Dalhousie Dr
Kamloops, B.C.
V2C 5Z5
Tel: (250) 371-6200
Fax: (250) 828-4000

Kootenay
401 – 333 Victoria St
Nelson, B.C.
V1L 4K3
Tel: (250) 354-6333
Fax: (250) 354-6332

205 Industrial Rd G
Cranbrook, B.C.
V1C 7G5
Tel: (250) 489-8540
Fax: (250) 489-8506

Cariboo
300 – 640 Borland St
Williams Lake, B.C
V2G 4T1
Tel: (250) 398-4530
Fax: (250) 398-4214

Omineca Peace
325 – 1011 4th Ave
Prince George, B.C.
V2L 3H9
Tel: (250) 565-6135
Fax: (250) 565-6629

Skeena
3726 Alfred Ave
Smithers, B.C.
V0J 2N0
Tel: (250) 847-7334
Fax: (250) 847-7556

Vancouver Island
2080A Labieux Rd
Nanaimo, B.C.
V9T 6J9
Tel: (250) 751-7074
Fax: (250) 751-7079

Lower Mainland
2nd Fl 10470-152nd St
Surrey, B.C.
V3R 0Y3
Tel: (604) 582-5200
Fax: (604) 582-5235

Okanagan
102 Industrial Pl
Penticton, B.C.
V2A 7C8
Tel: (250) 490-8200
Fax: (250) 490-2231

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1259 Dalhousie Dr
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Tel: (250) 371-6200
Fax: (250) 828-4000

Kootenay
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Nelson, B.C.
V1L 4K3
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Fax: (250) 354-6332

205 Industrial Rd G
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Fax: (250) 847-7556

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4,838 fewer kg of solid waste;
203 litres of water; and
735 fewer kg greenhouse gases.